

VOL. XXXVIII No. 4

APRIL 1953

MECCANO

MAGAZINE



MOBILE CRANES AT WORK

1½

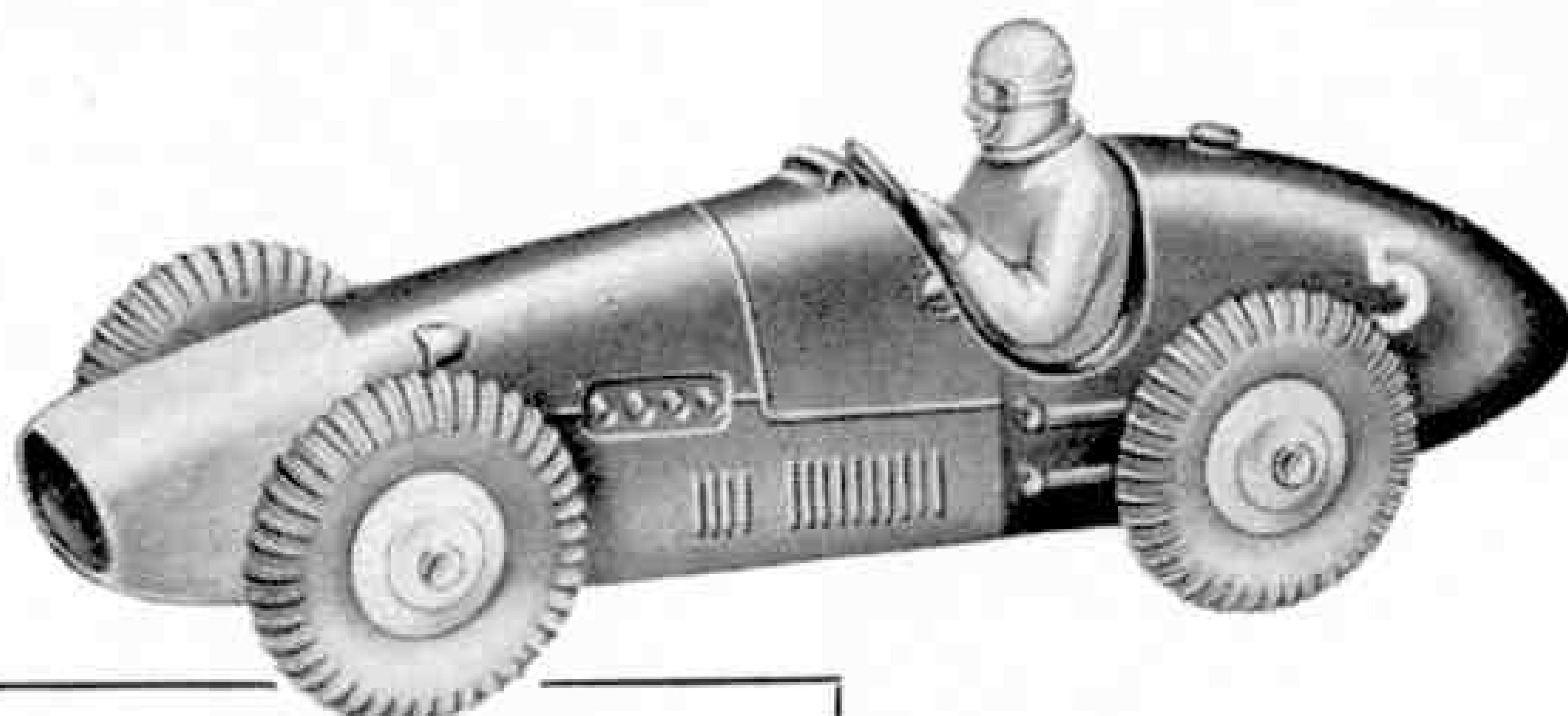
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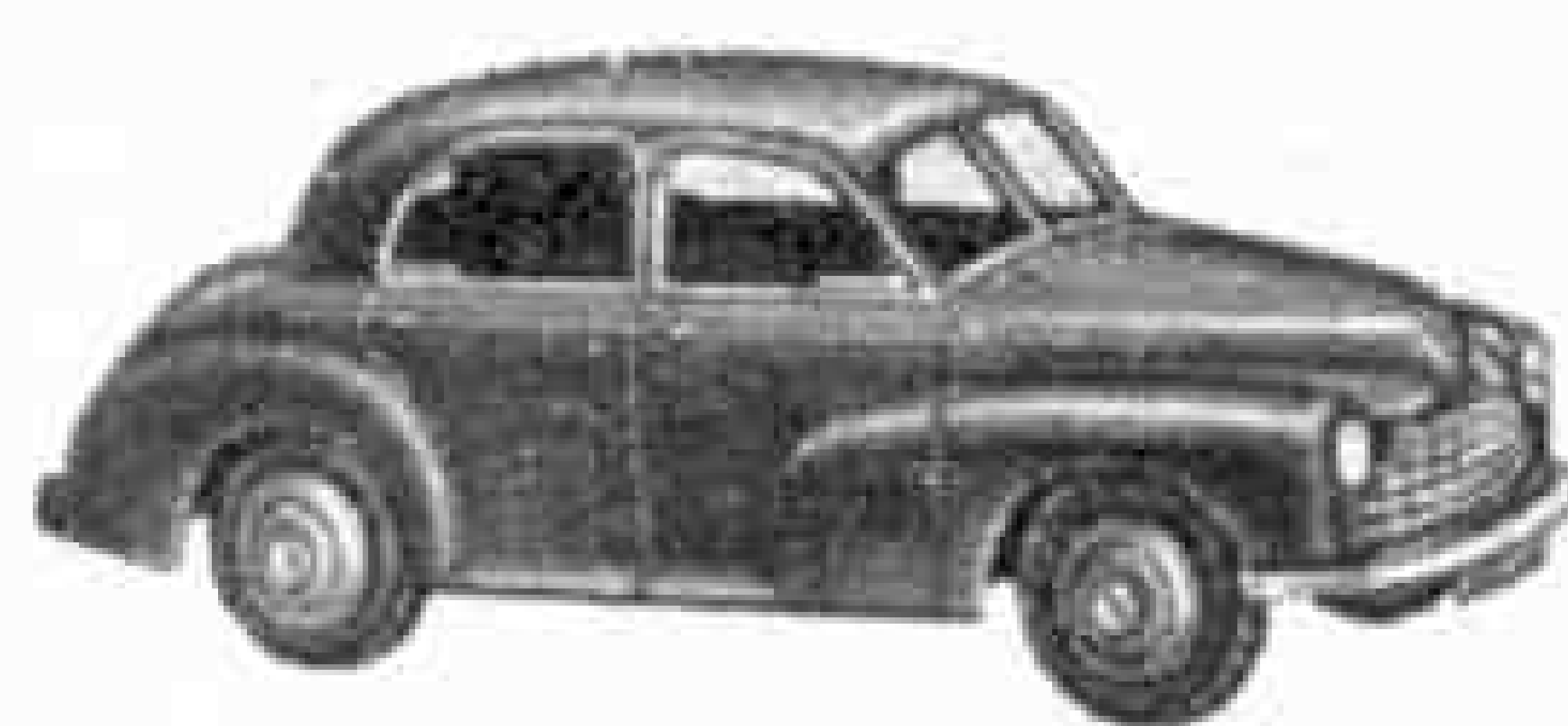
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Austin Devon Saloon
No. 40d
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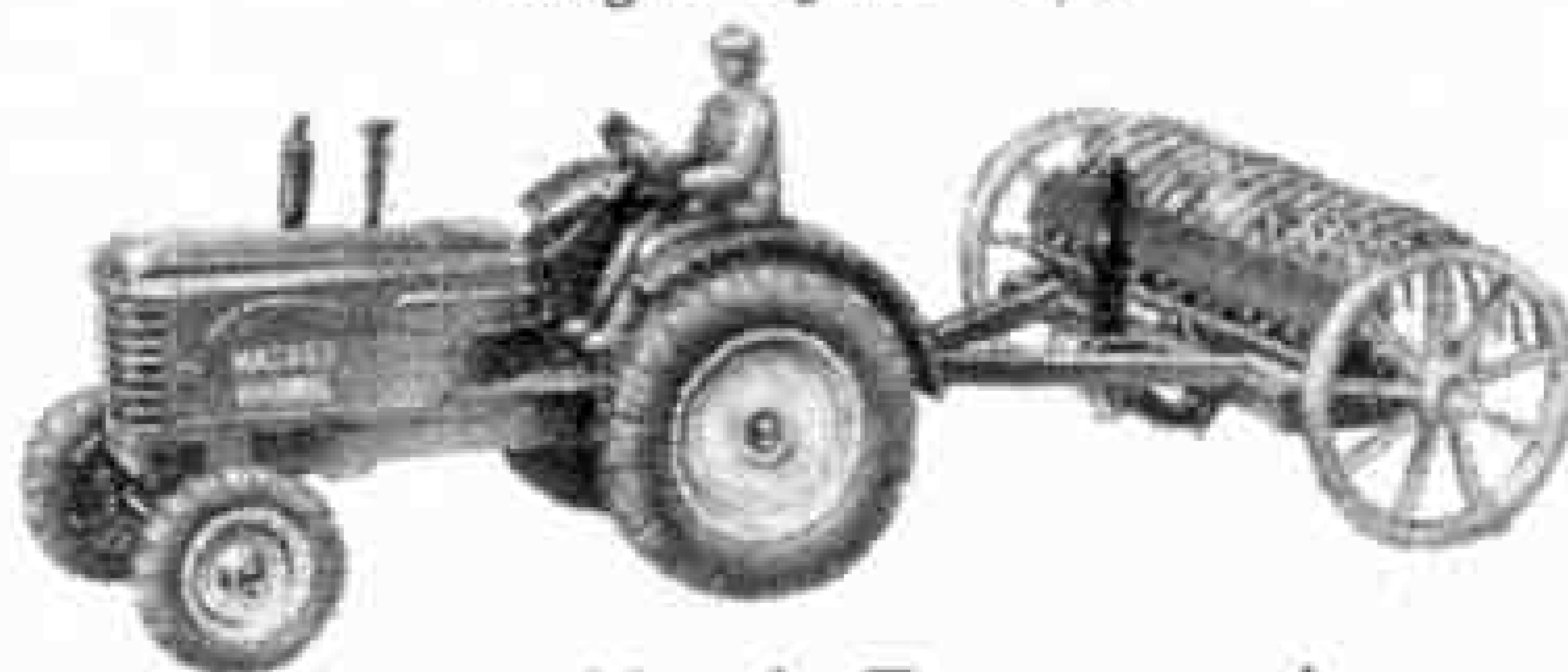
Austin Taxi
No. 40h
Length 3 $\frac{3}{8}$ in. 3/3



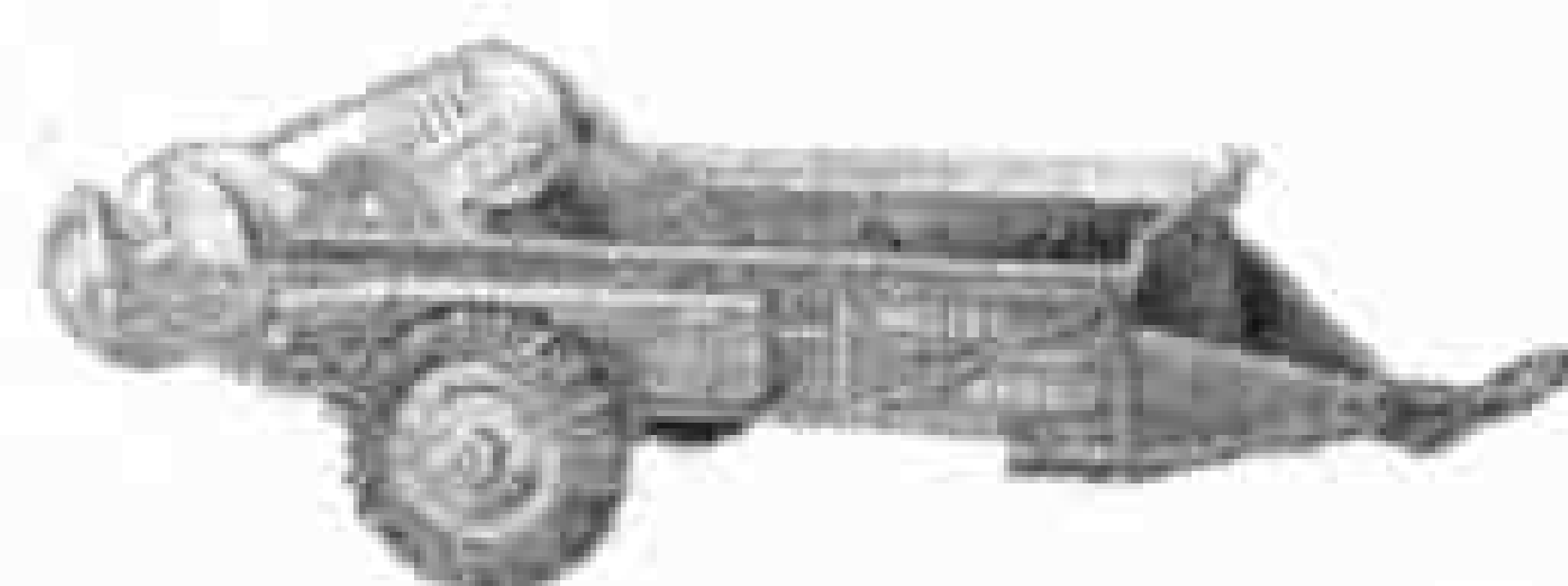
Morris Oxford Saloon
No. 40g
Length 3 $\frac{3}{8}$ in. 2/5



Harvest Trailer
No. 27b
Length 5 $\frac{1}{8}$ in. 3/7



Massey-Harris Tractor and
Hay Rake, No. 27ak
Overall length 6 in. 8/6
Hay Rake No. 27k, Length 3 in. 4/3



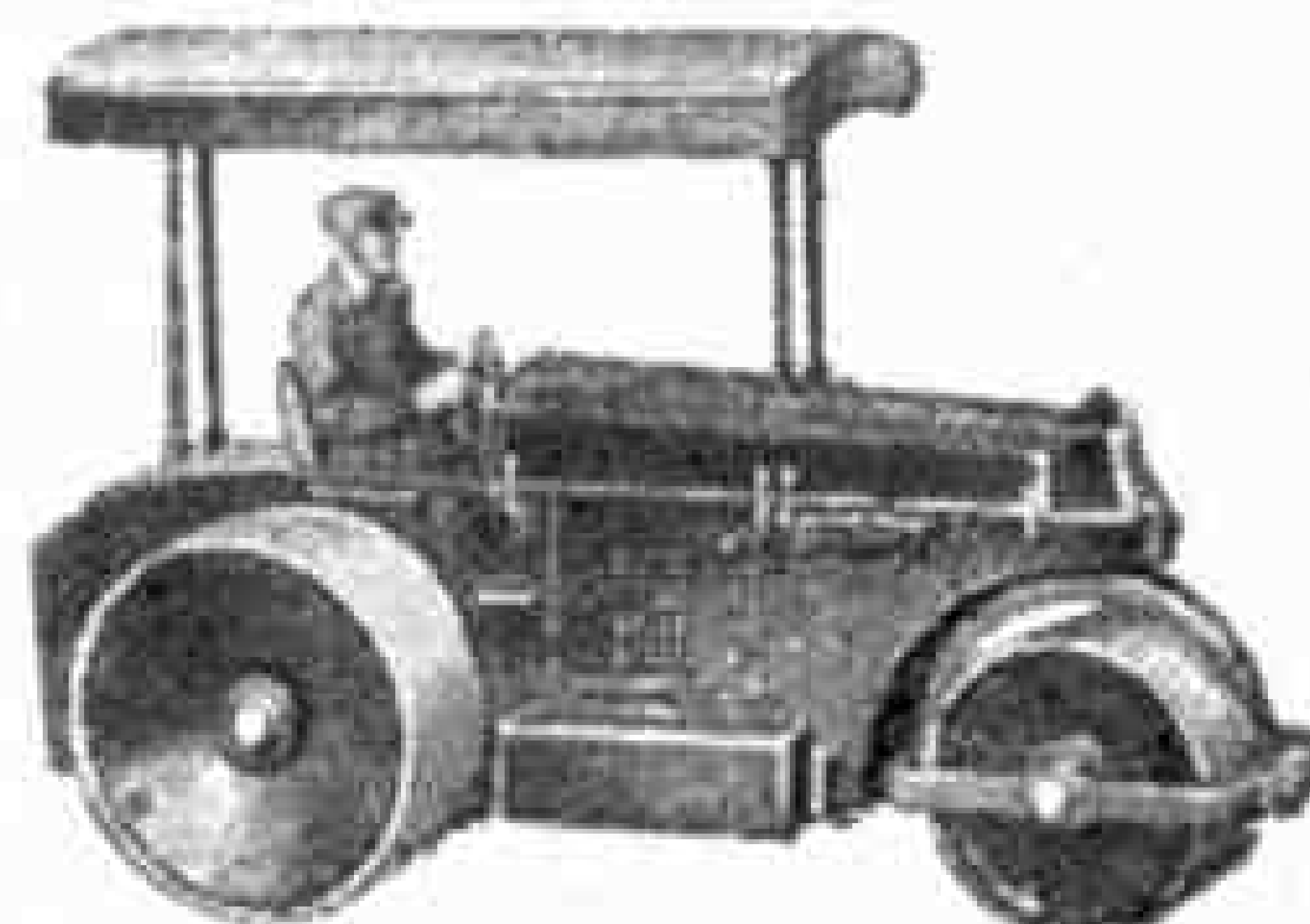
Massey-Harris Manure
Spreader, No. 27c
Length 4 $\frac{1}{8}$ in. 4/4



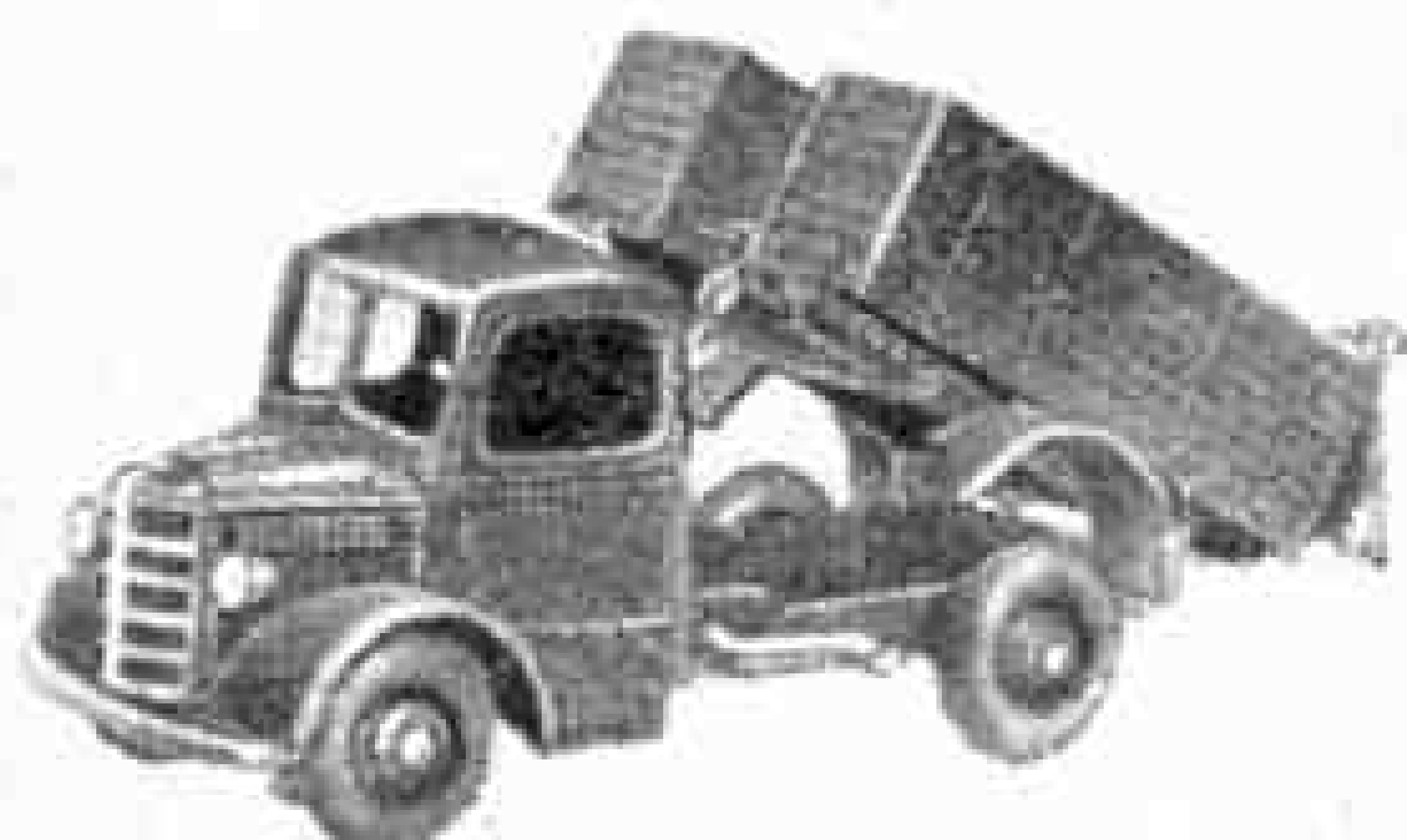
Breakdown Lorry
No. 25x
Length 4 in. 5/9



Austin Covered Wagon
No. 30s
Length 3 $\frac{3}{8}$ in. 3/2



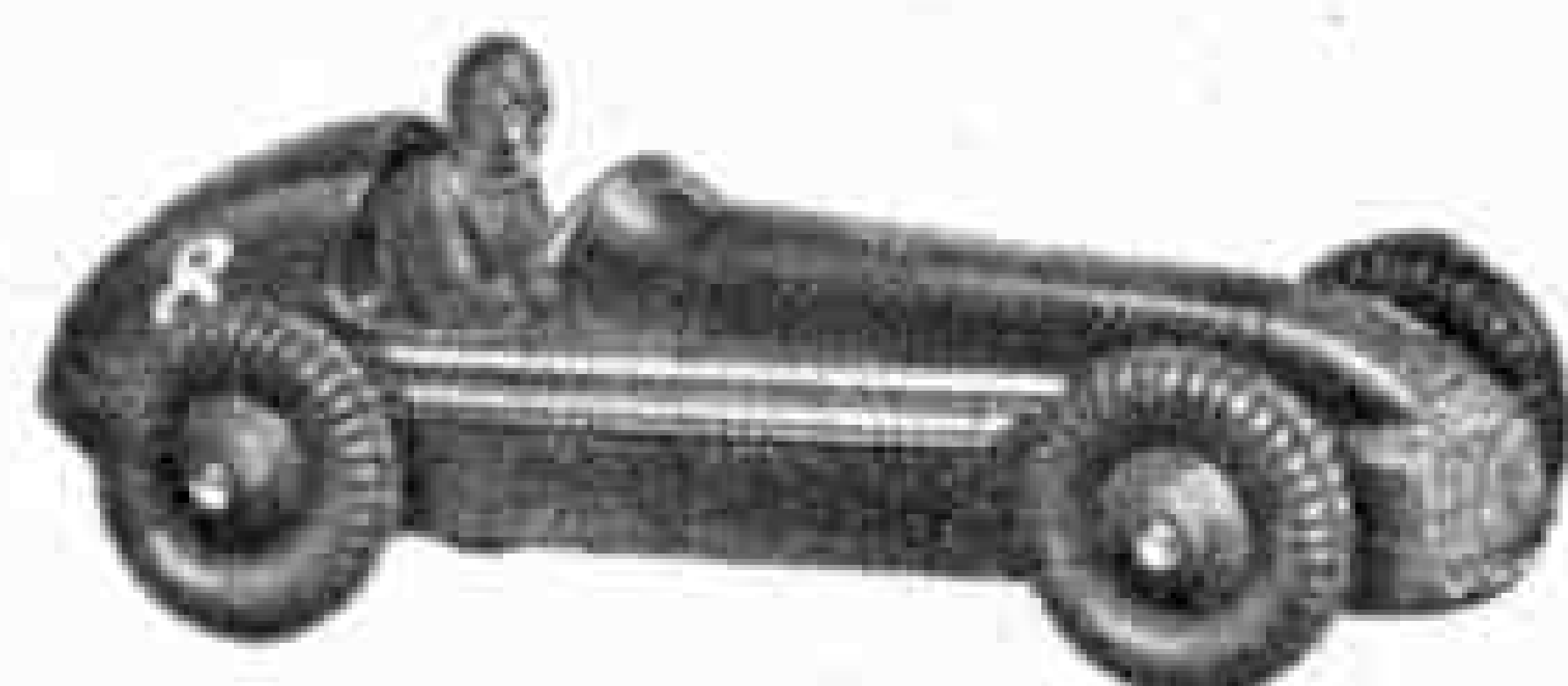
Aveling-Barford Diesel Roller
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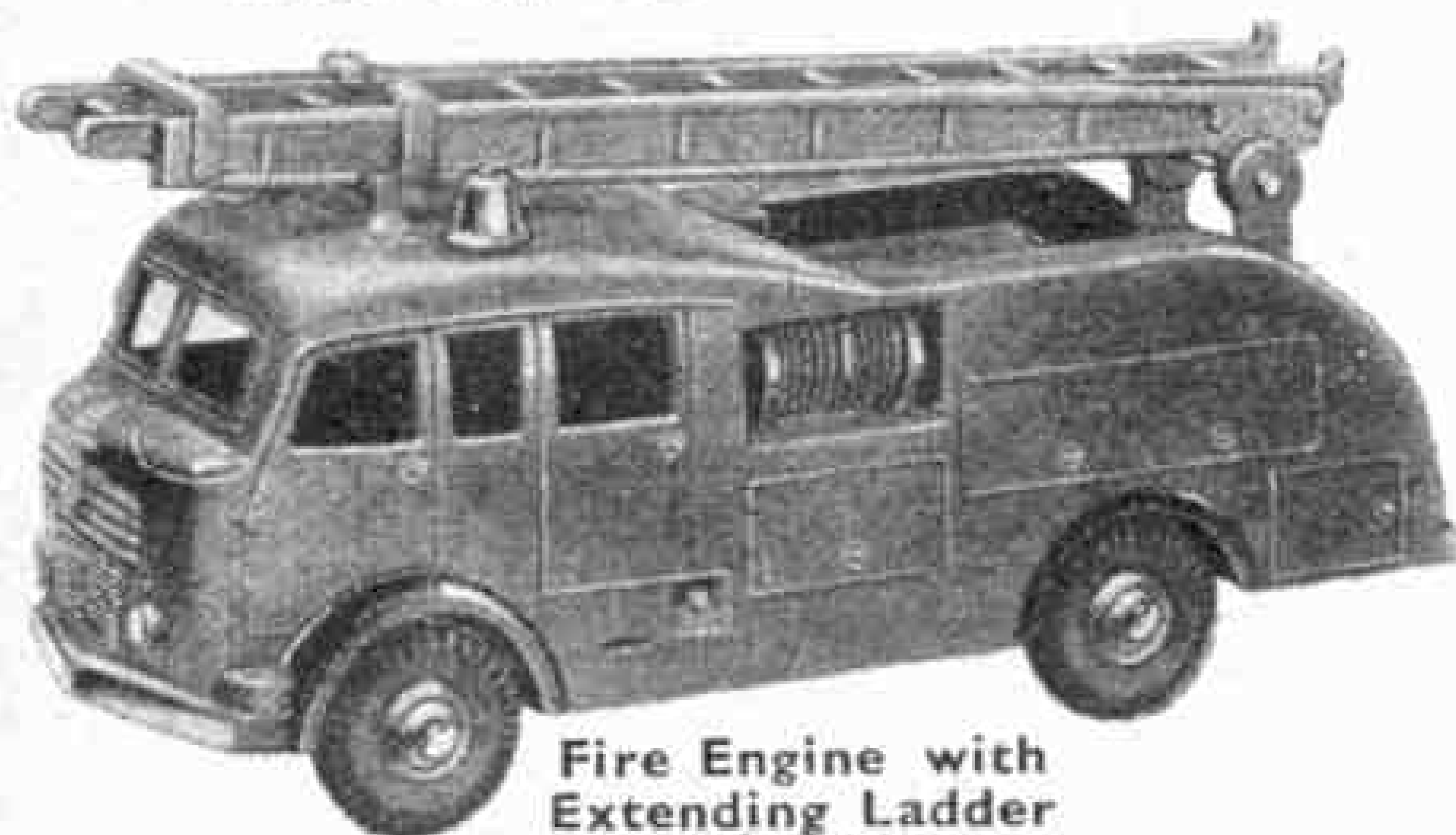
Bedford End Tipper
No. 25m
Length 4 in. 5/6



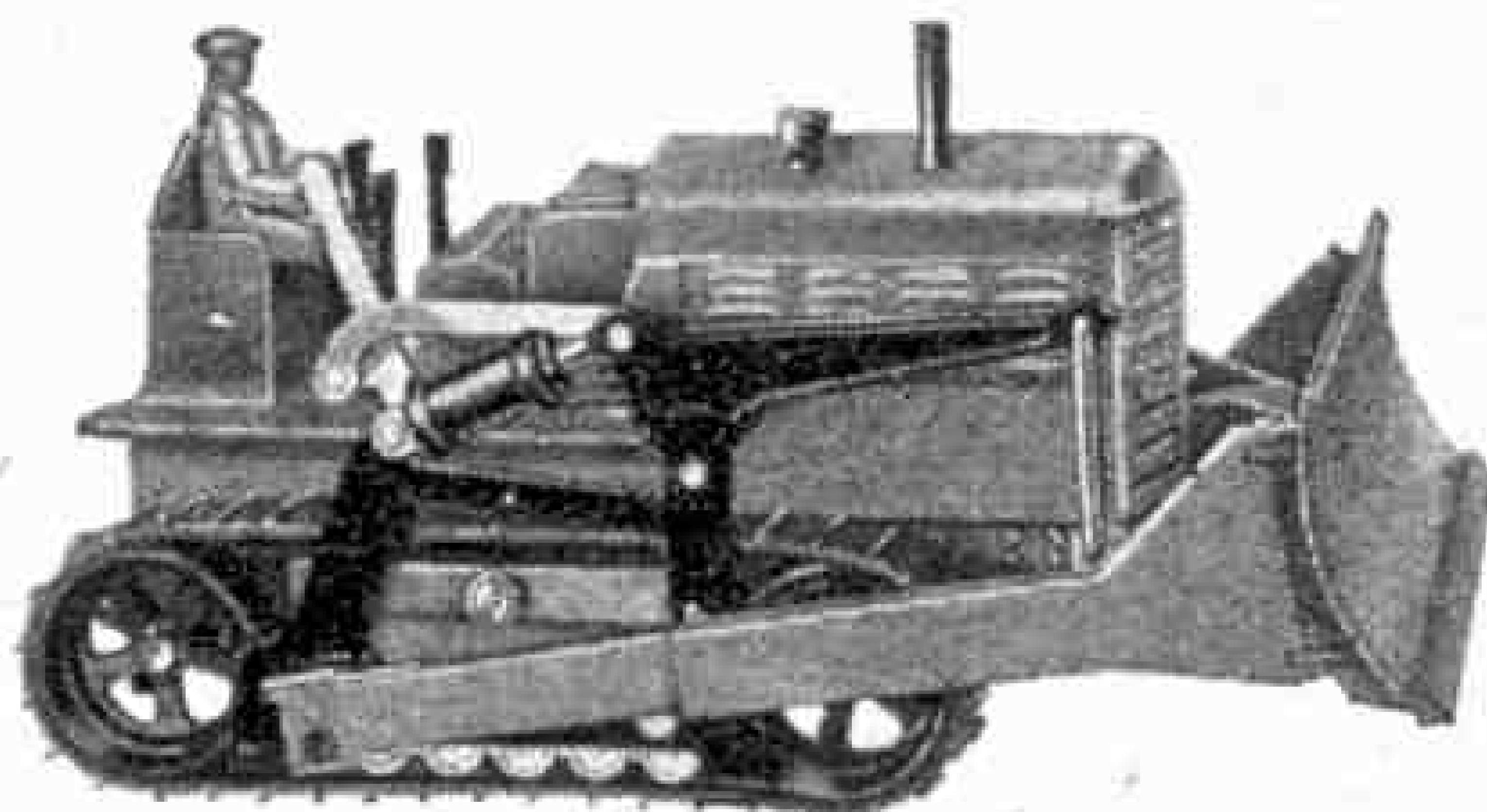
Cooper-Bristol Racing Car
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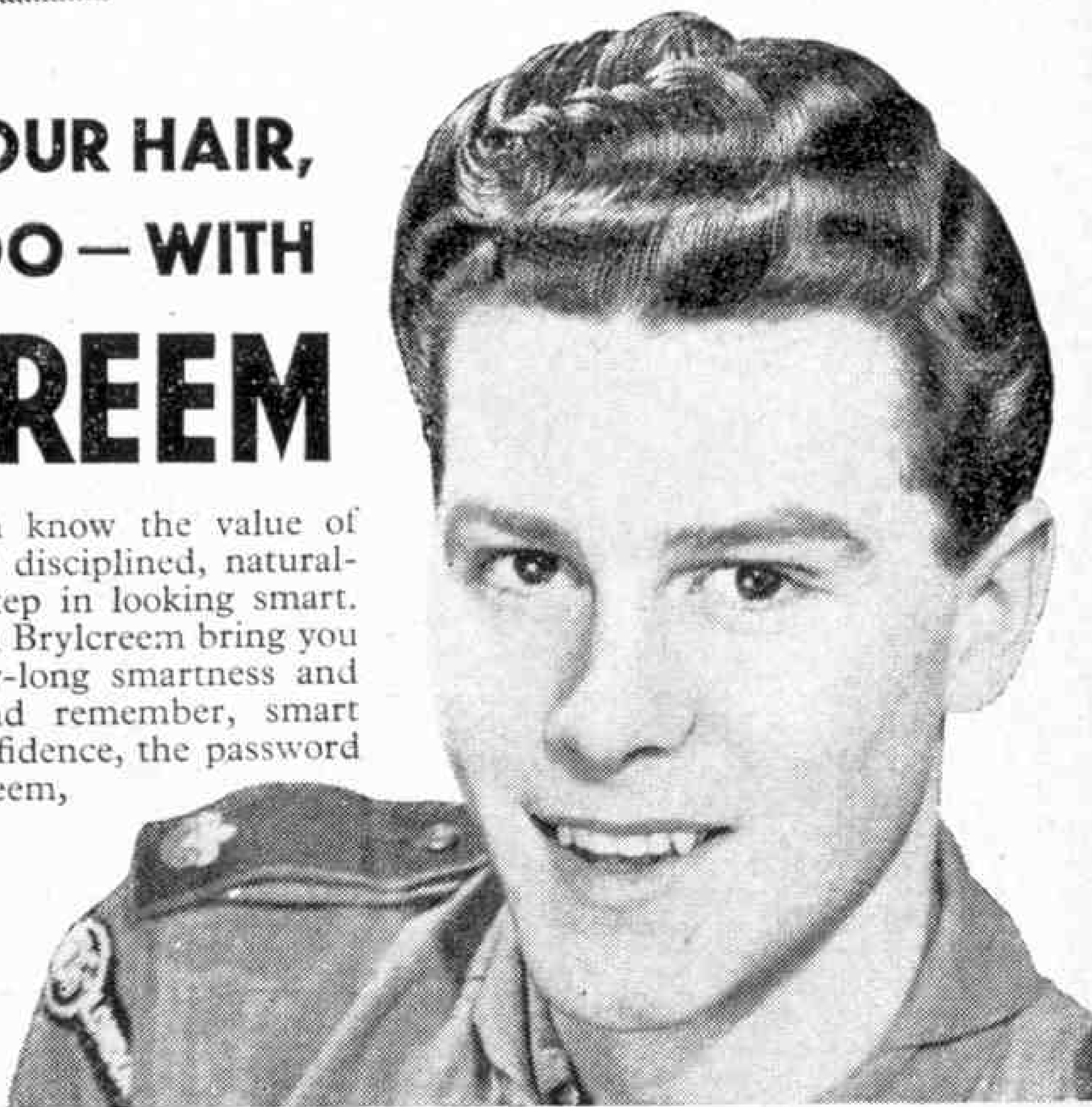
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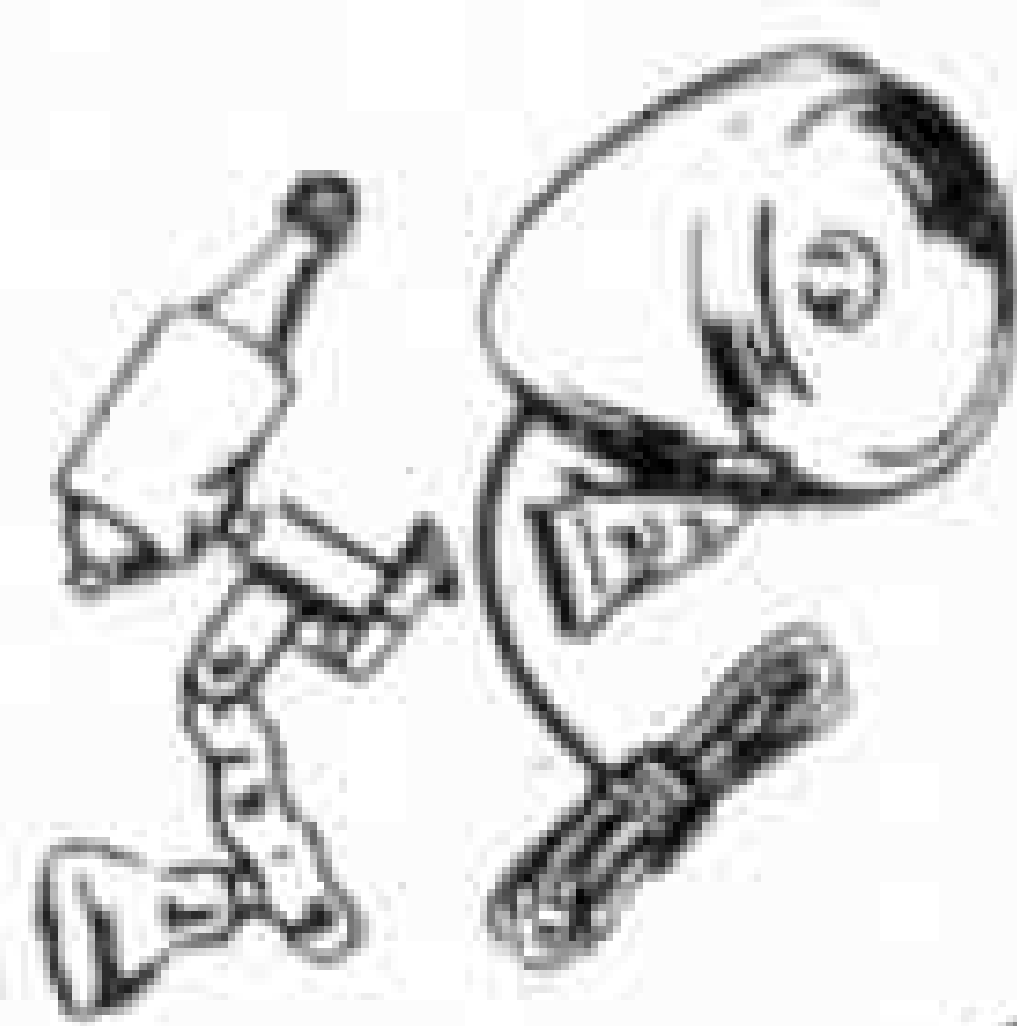
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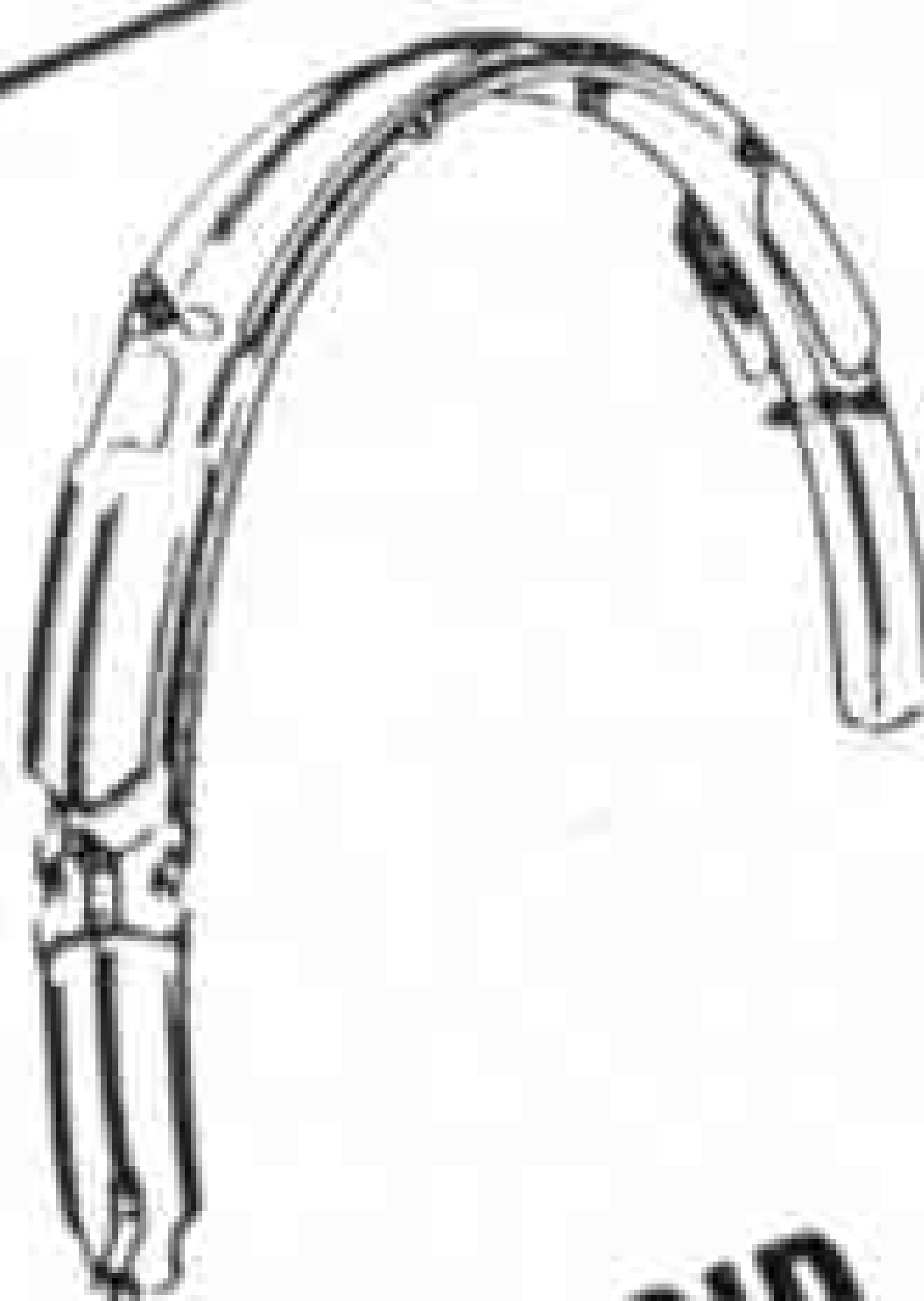
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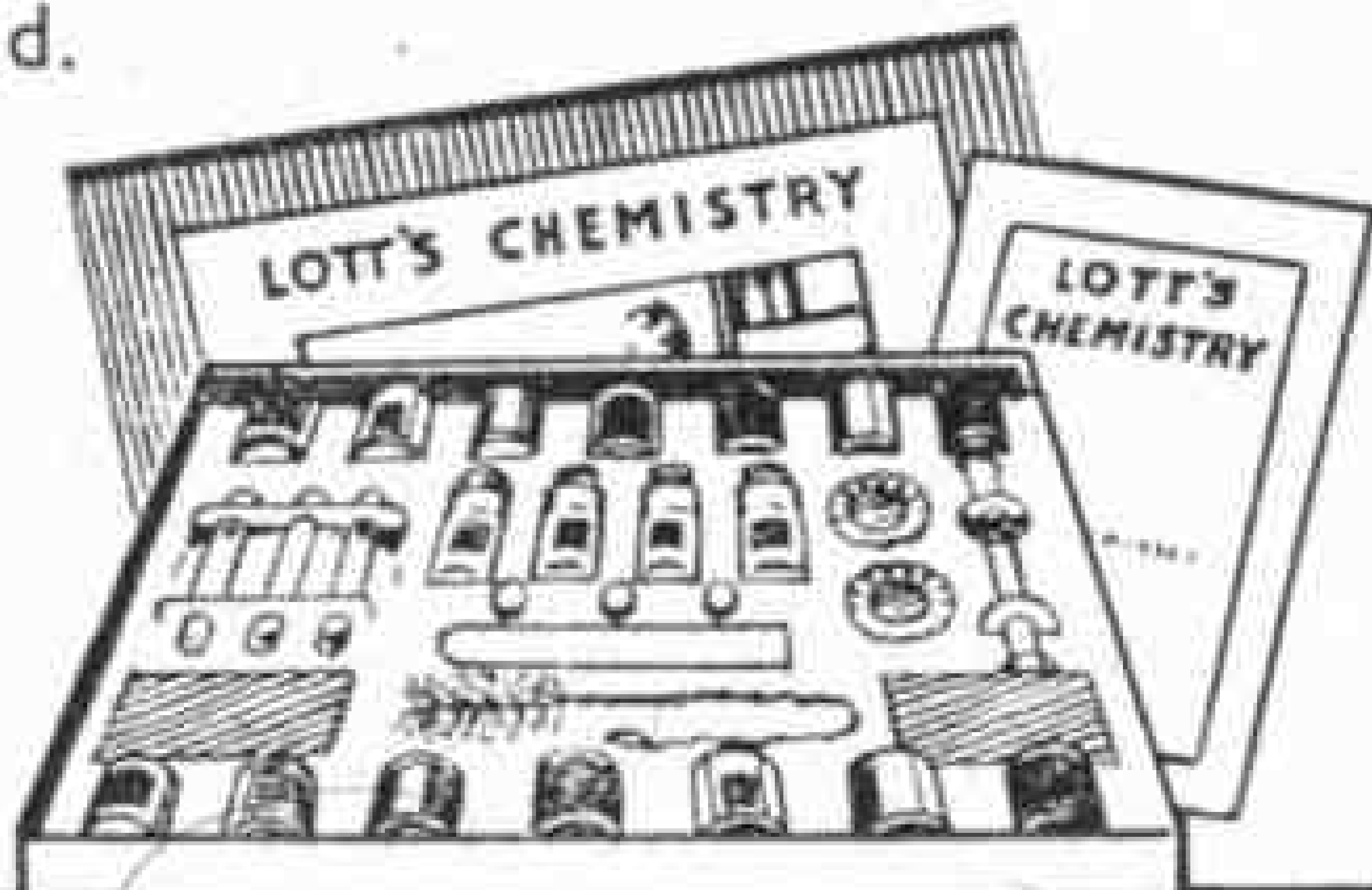
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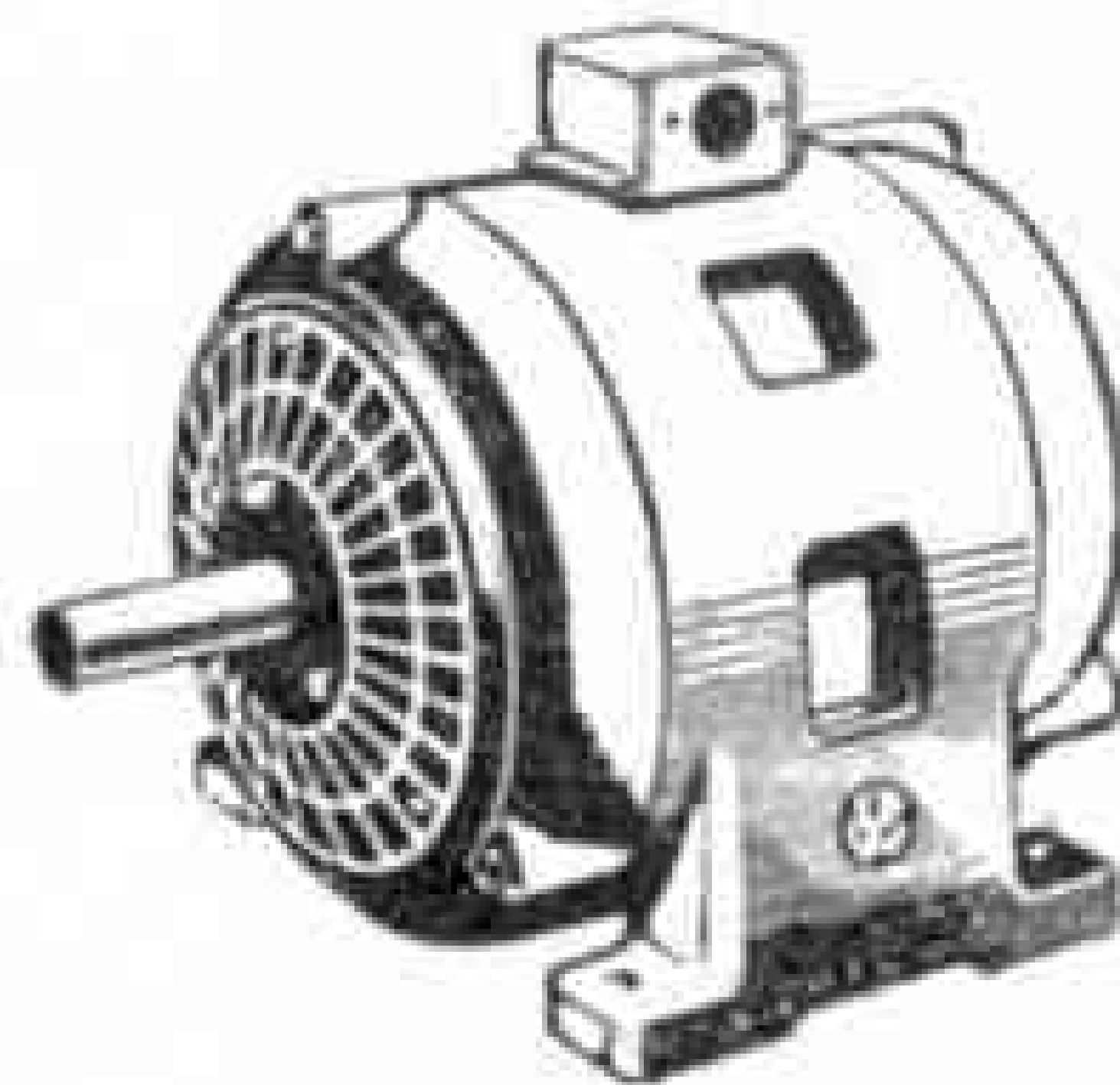
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MINIC

CLOCKWORK
*Scale
Models*

Series 1



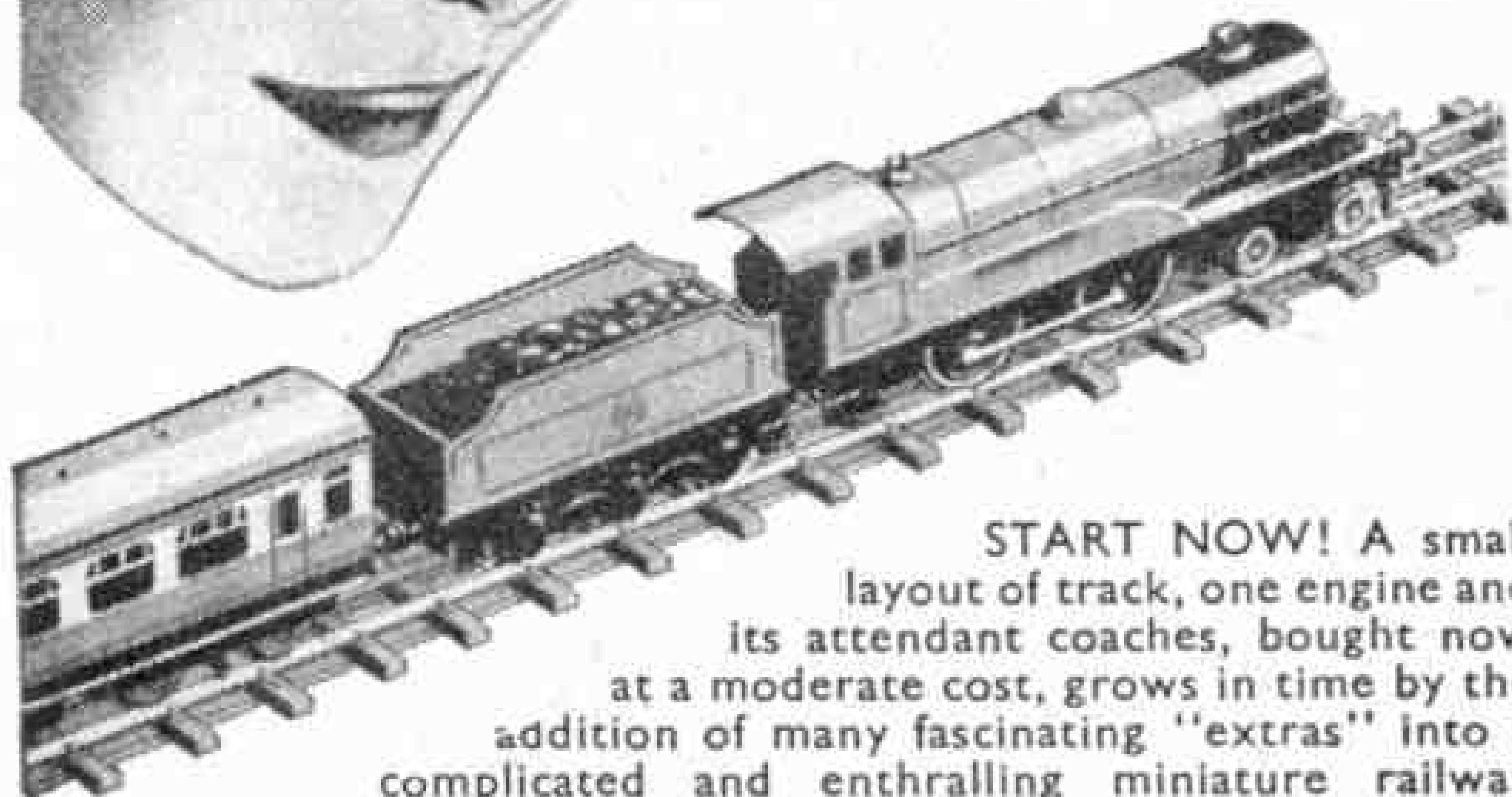
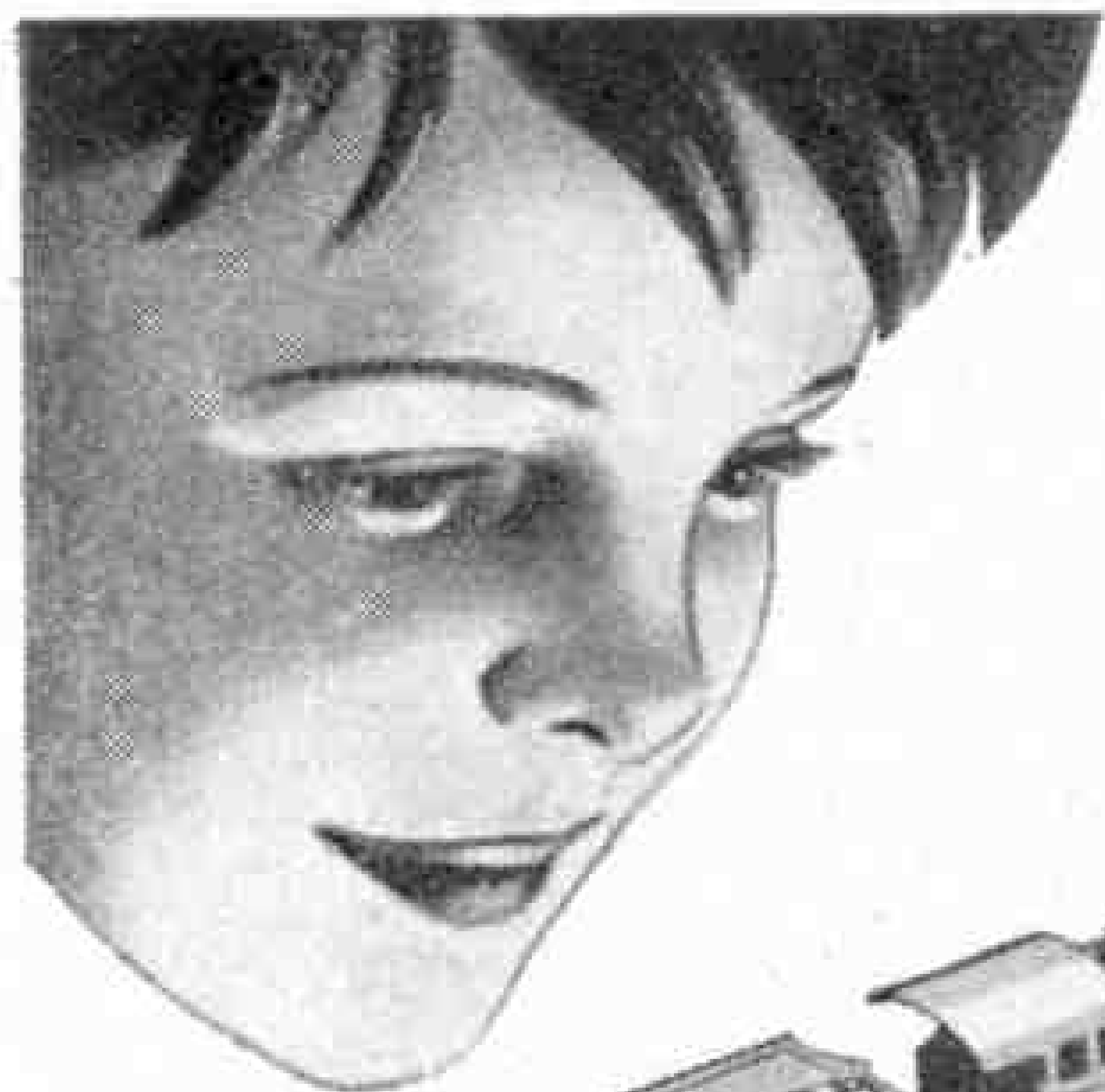
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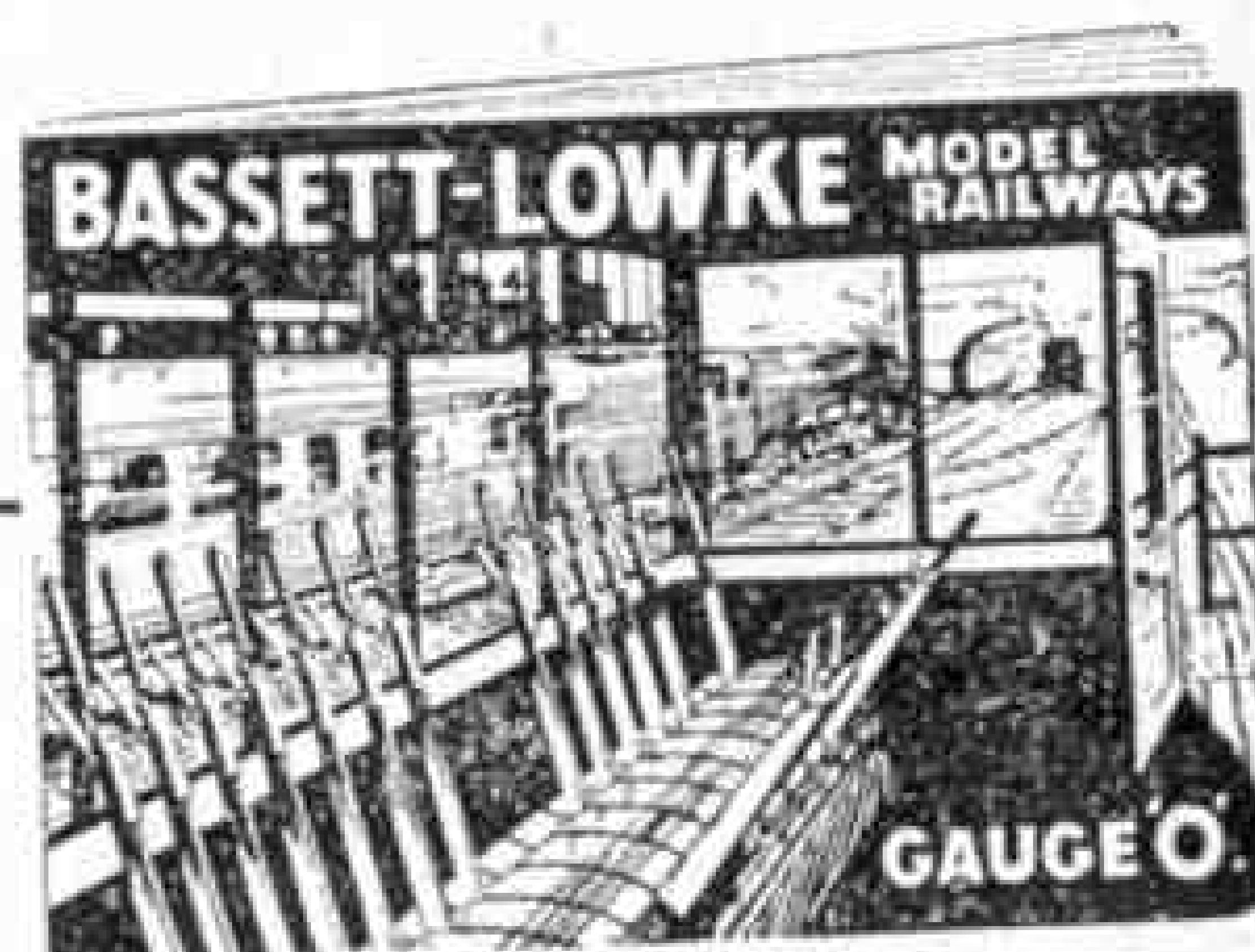
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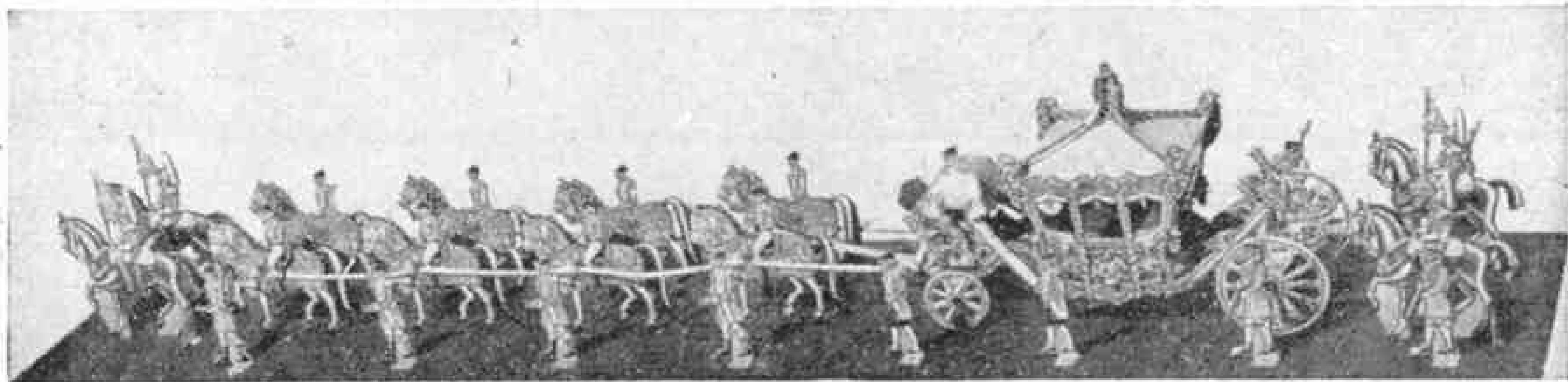


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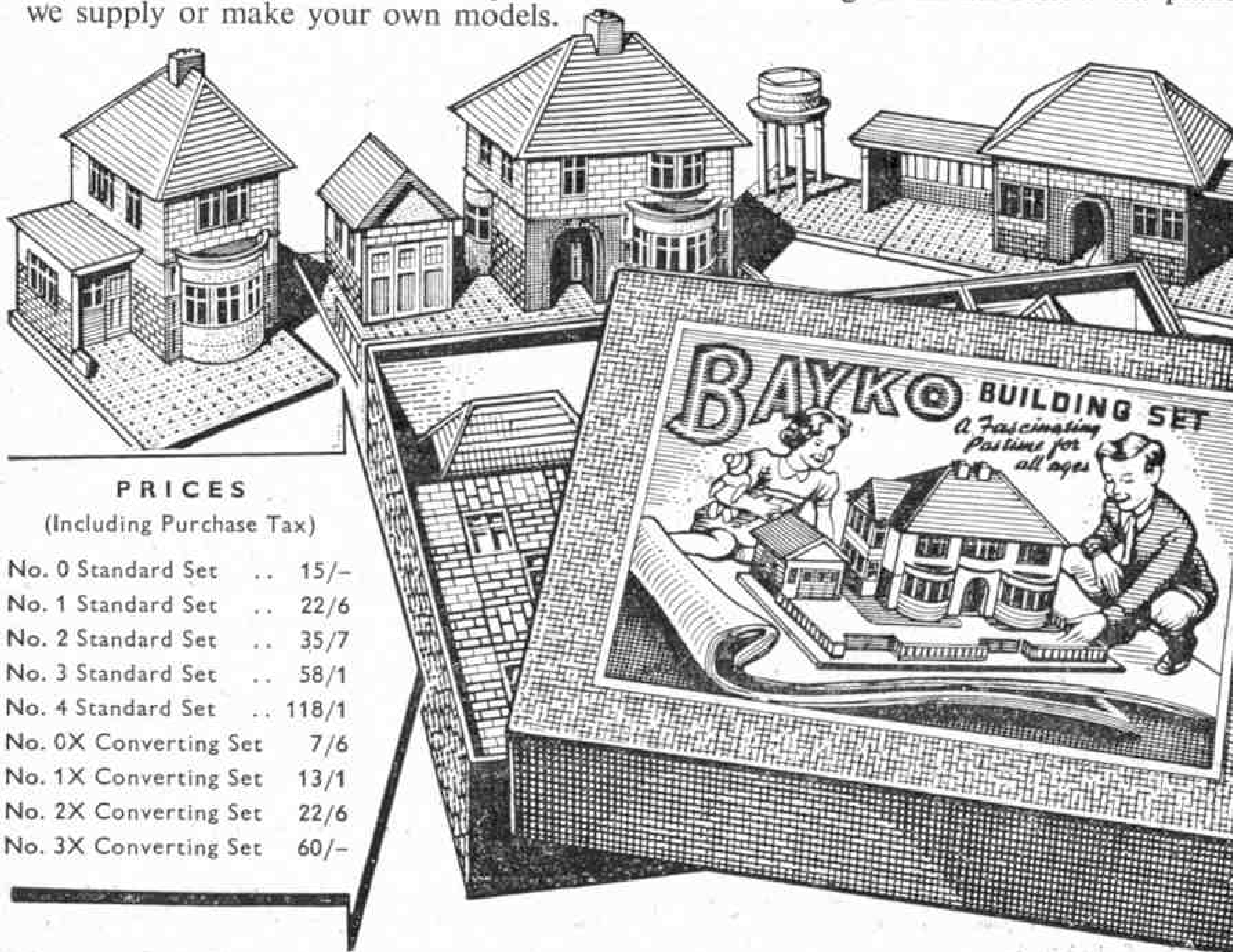
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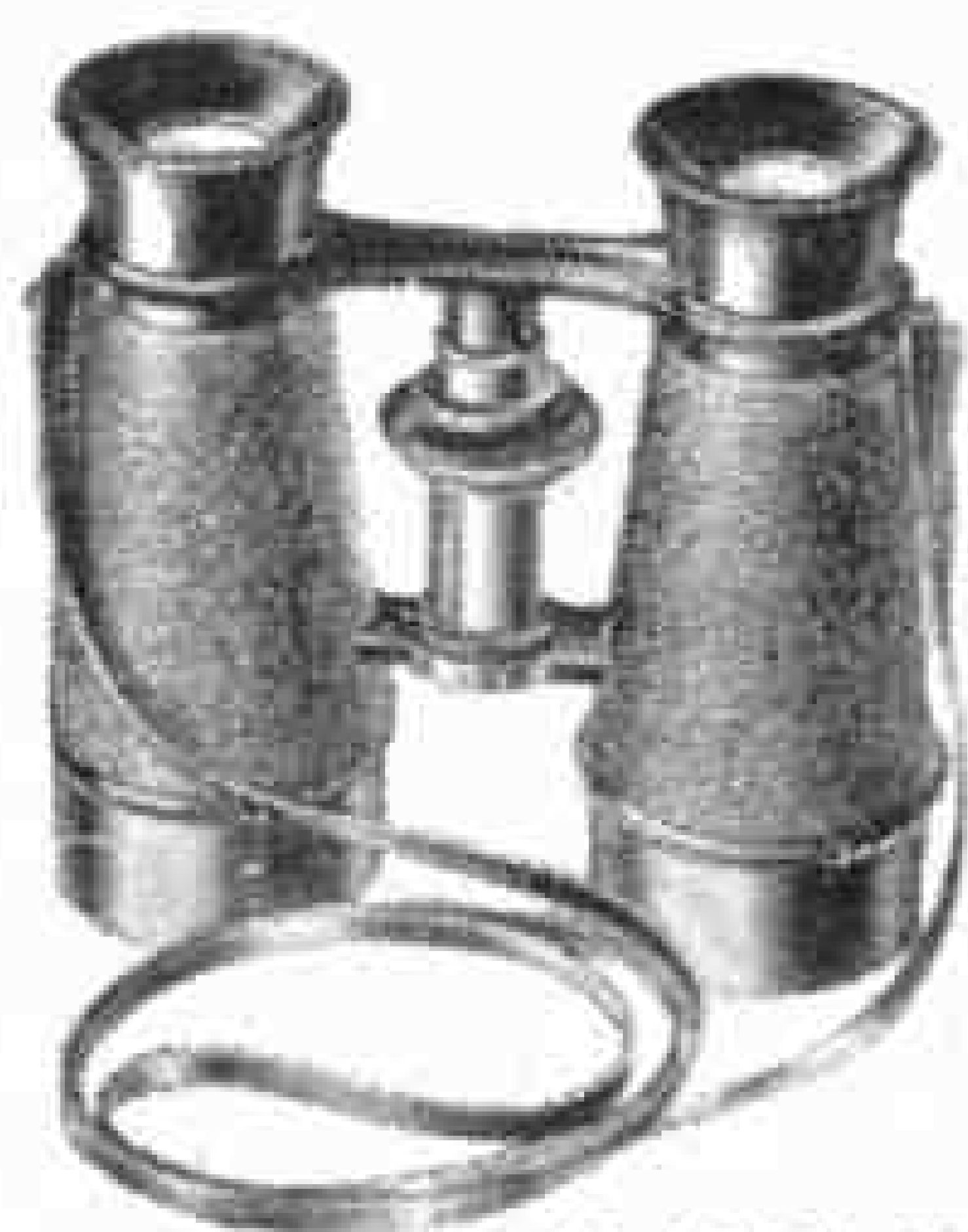
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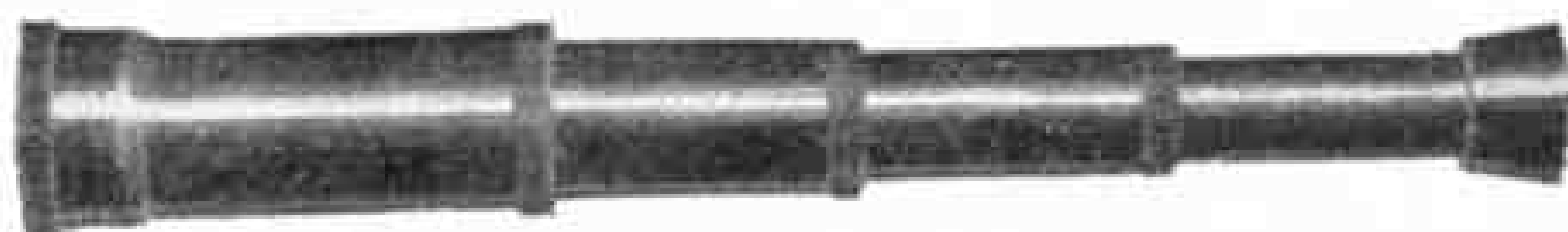
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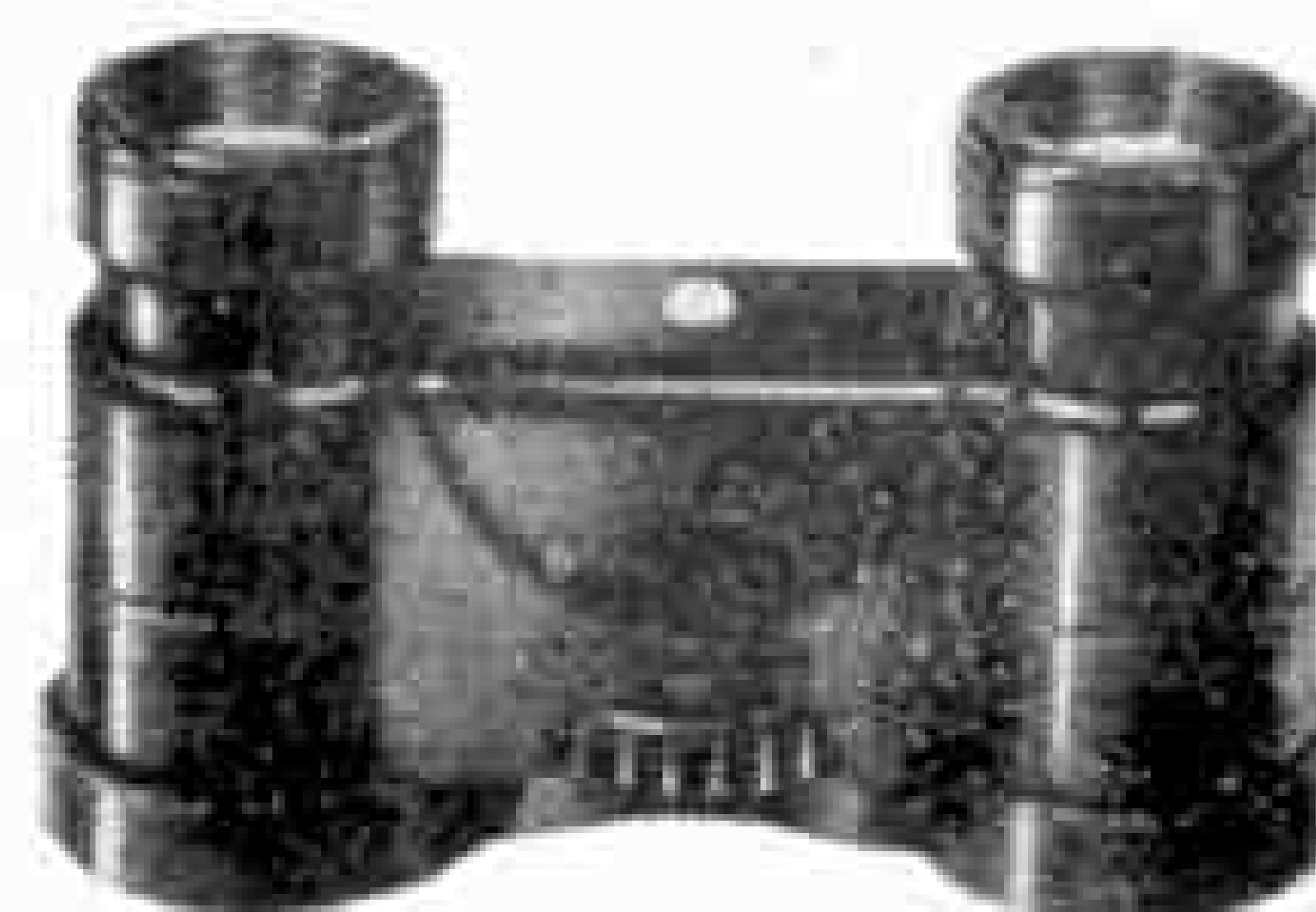
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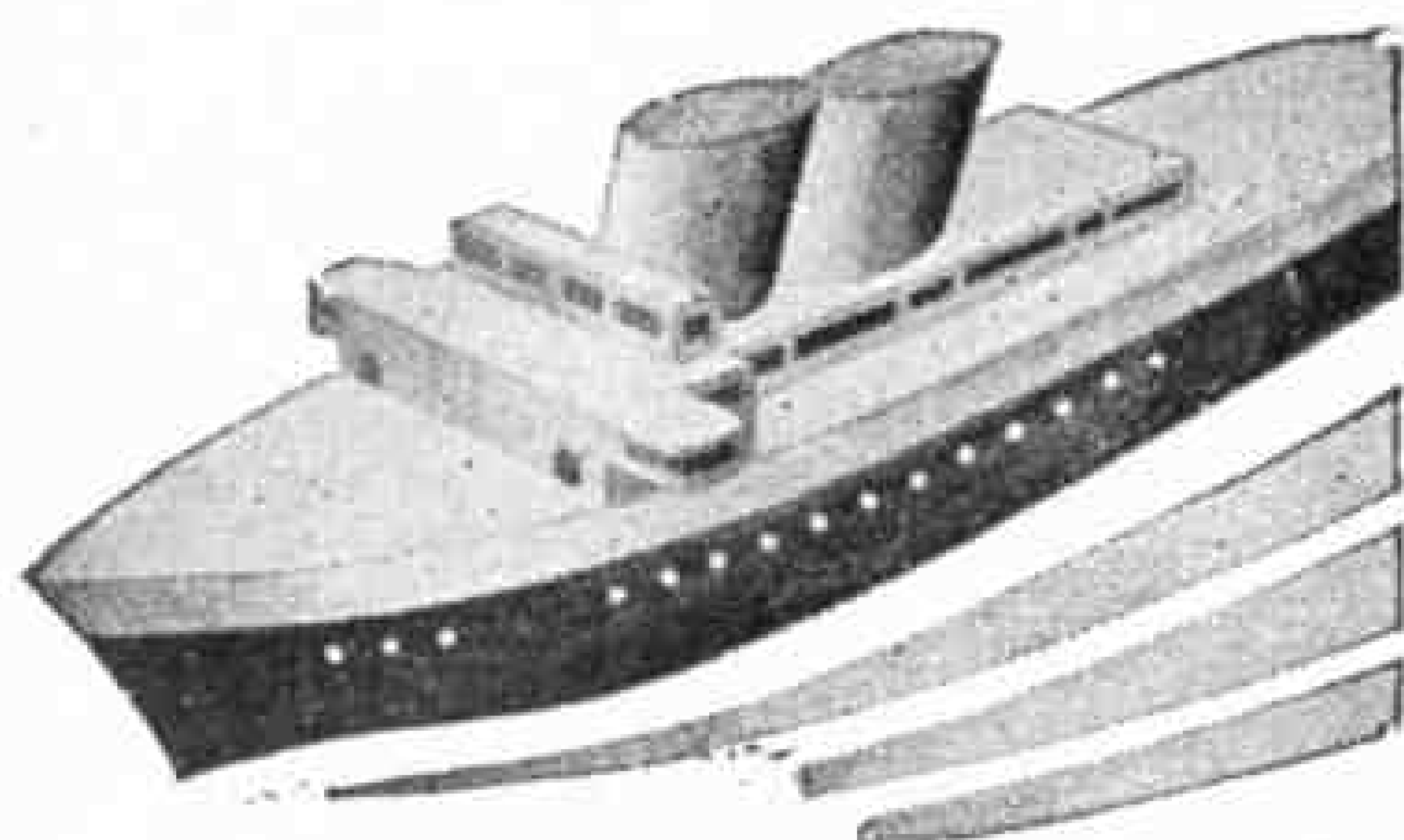


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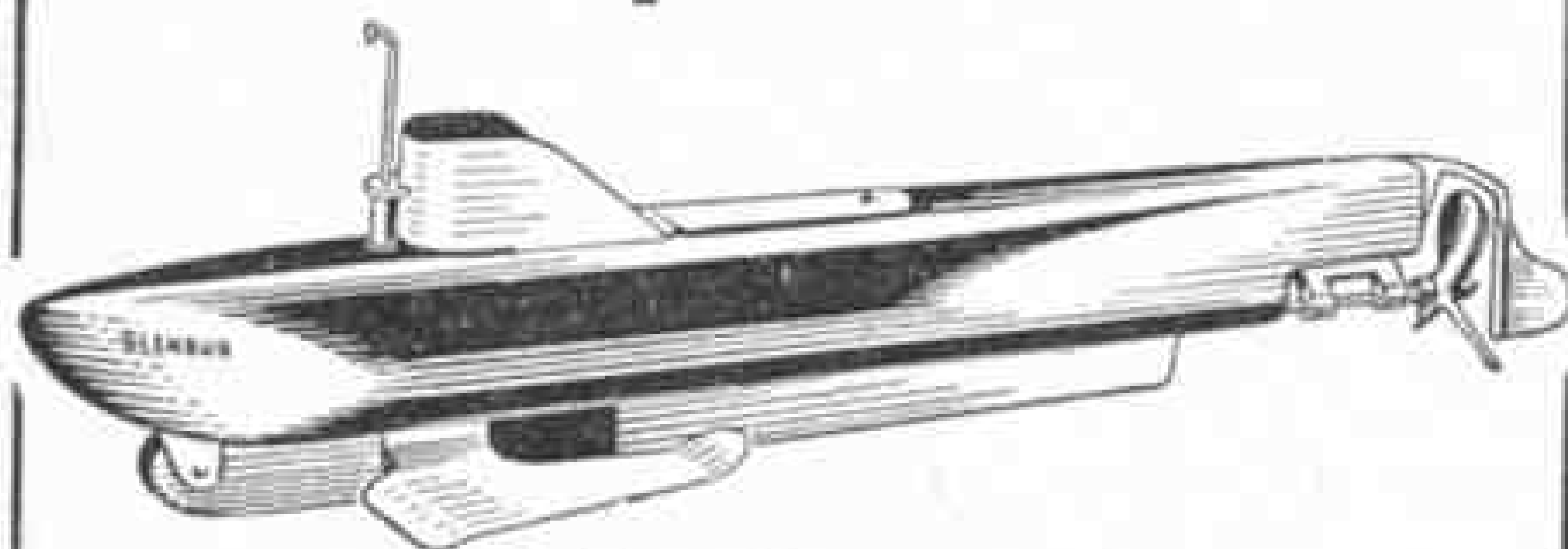
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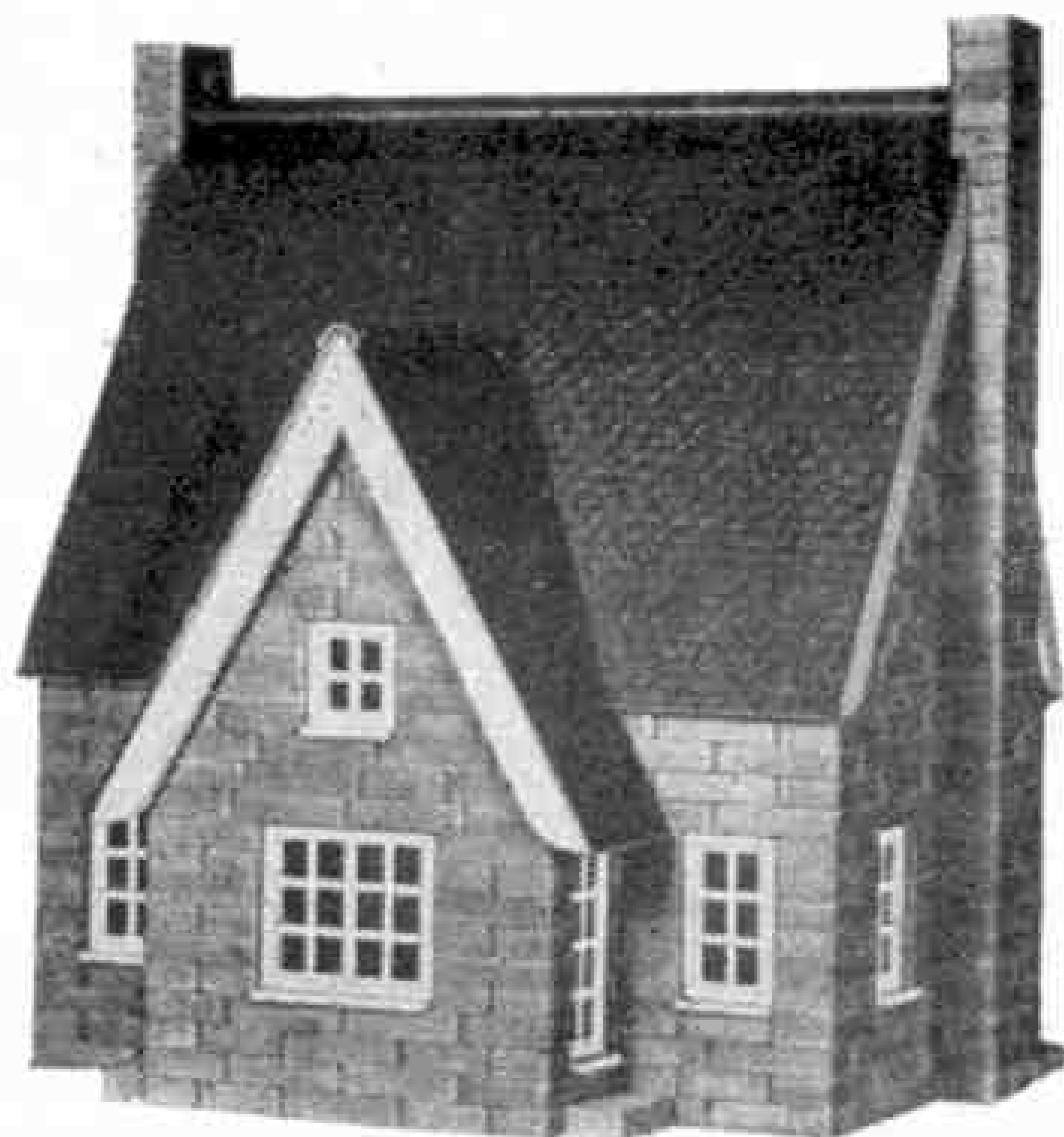
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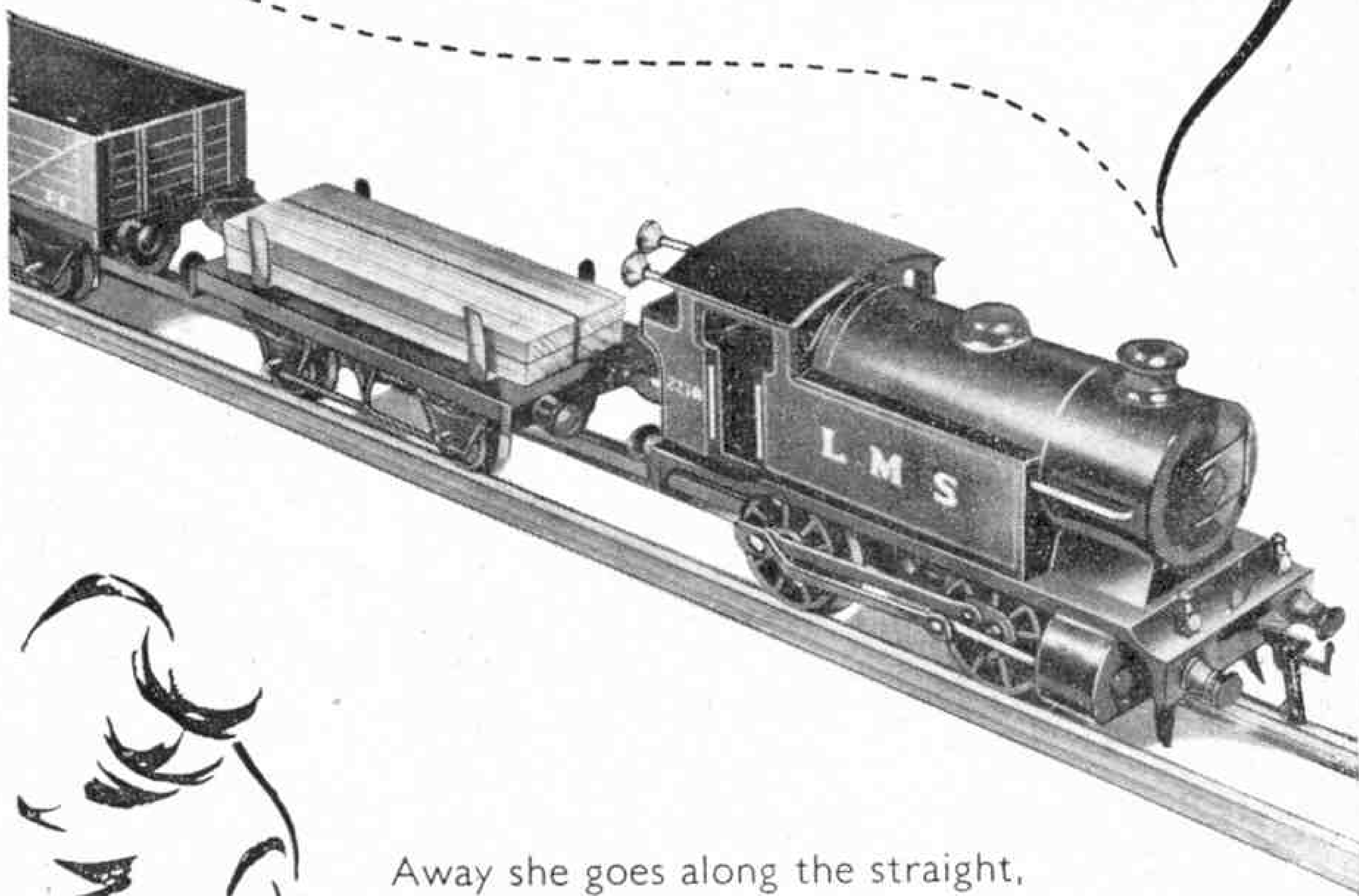
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Next Month: "OUR AUSTRALIAN VISITORS." By Cyril Washbrook

MECCANO

MAGAZINE

Editorial Office:
Binns Road
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Vol. XXXVIII
No. 4
April 1953

Clear Road Ahead

In my boyhood days I would have given much for the opportunity of opening the regulator of a locomotive and setting it off in spectacular style on its journey, or at least of pulling the cord that blows the whistle. All of you will have had similar ambitions. For my illustration this month I have chosen a picture of one who has achieved his wish in this respect, and has earned the right to drive a locomotive by a long and arduous training. And a very fine picture he presents of a skilled craftsman concentrating on his task. He has his powerful machine thoroughly under control, while he is looking ahead for signals and making sure that he has a clear track in front of him.

What is Mecc. Mag. Day?

The first day of the month is Mecc. Mag. Day to one reader and his friends.

These enthusiasts also tell me that long before the end of one month they eagerly thumb over the pages of their diaries to find out on what day the next begins, so that they will know in advance exactly when to dash off to their newsagents or dealers. This eagerness is not theirs alone. It is shared by thousands.

All this, with the friendly comments in letters from many readers, is evidence of the success of the new *M.M.* Further proof is to be found in the fact that although the number of copies printed has been increased in recent months there have been urgent demands for more after

the whole issue has been sold out. This month I have had still more printed, but there is still a risk that those readers who have not placed regular orders with their Meccano dealers or newsagents will find that they cannot get copies—and the

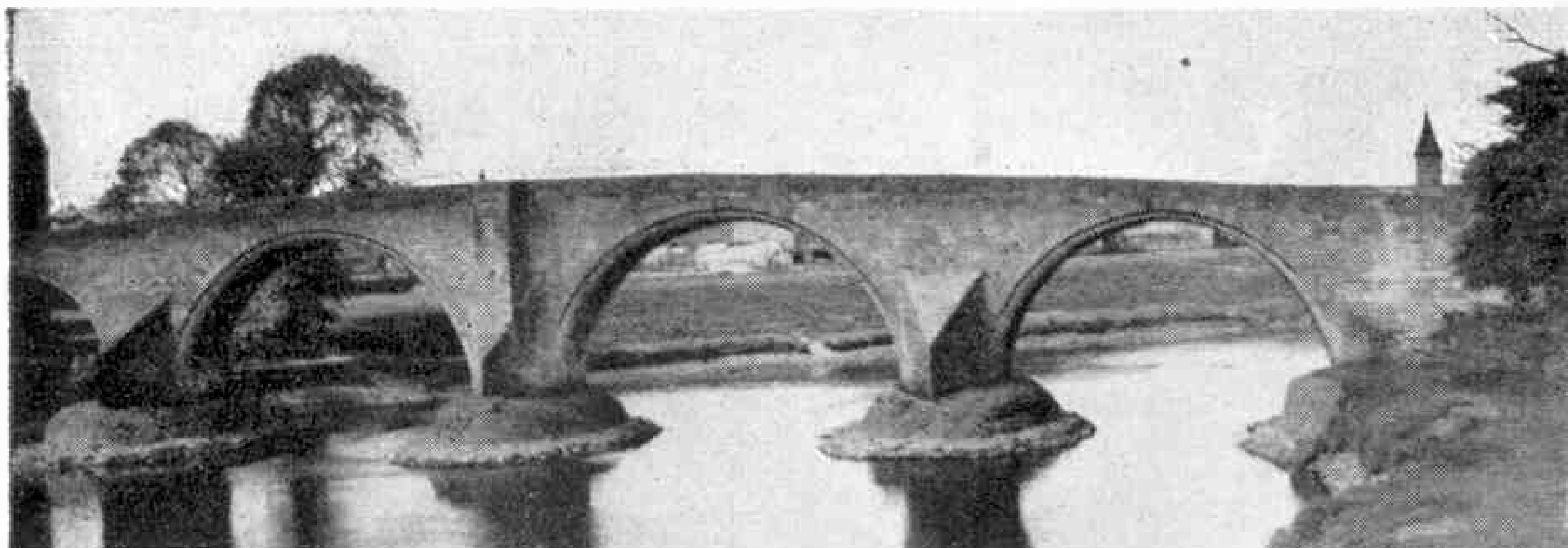


Skill and experience at the controls of a B.R. standard locomotive. British Railways photograph.

absence of even one issue spoils a volume.

Before increasing the price of the *M.M.* and adding to its attractions I was convinced that readers would be delighted to have the opportunity of reading a well-produced Magazine, bright in appearance and informative and attractive in its contents. My confidence has been well justified, and now the new Magazine is well set for an increasingly successful career.

The Editor



AS with a good many other things, traffic developments during the last hundred years or so have been so revolutionary as to render obsolete bridges that have served their purpose successfully for centuries, and might have still gone on doing so almost indefinitely.

It is a curious fact, in this connection, that mediæval bridges, so far as strength is concerned, have on the whole stood better than those of the eighteenth century, the era of great bridge engineers and the start of scientific bridge building. Many an eighteenth century bridge has had to be strengthened by tie bars and plates; few mediæval bridges have needed this attention. Westminster Bridge, built in 1750, and Blackfriars Bridge, London, built in 1771, have both been rebuilt; Westminster within a hundred years. The original Waterloo bridge had a life of some hundred and twenty years, but old London bridge lasted over six centuries. The fifteenth century bridge at Abingdon still serves a vastly increased traffic: an elliptical arch built in 1790 was found to be unsafe, and had to be rebuilt in 1927.

It is true that mediæval and immediately post-mediæval records are full of references to "ruinous" bridges and bridges needing repair, but this was generally on account of gross neglect in maintenance rather than from any inherent structural defects. The explanation probably is that mediæval builders, without the scientific knowledge and abstruse calculations of more recent bridge builders, did not "sail near the wind" and often used an excess of material, to make sure, rather than the reverse.

Often, as in the case of old London Bridge, this resulted in difficulty with the passage of the water and flooding, but despite this, London bridge lasted many centuries without "improvement," no doubt with the help of the "starlings" on which the bridge was set. These had the effect of keeping off the direct impact of the current on the piers themselves.

The trouble about ancient bridges, in relation to modern traffic, is more one of width. Leaving aside packhorse bridges, which might be as narrow as a couple of feet or so, but which were usually augmented by an adjoining ford used by carts and carriages, the mediæval bridge usually ranged from ten to twelve feet in width, a few having a width of thirteen or

fourteen feet and others even less than ten feet. Added to this constriction of the roadway was the difficulty of seeing over the bridge in the case of the "humped" crossings.

On byways, the narrowness of the crossing is not of great consequence, and many minor mediæval bridges have not only remained substantially unaltered, but are likely to do so for some years yet. Such fine old bridges as Crawford Bridge and Whitemill Bridge, in Dorset, though only ten feet wide, are so far adequate for

their purpose and too elegant in appearance to be wantonly supplanted. On much used roads the difficulty is obvious, and to leave the old bridge to carry the modern stream of traffic unaided is of course to create bottlenecks and traffic jams.

The simplest way of dealing with the problem would appear to some to be the drasting course of pulling down the old

New Bridges for Old

By F. W. Robins, F.S.A.

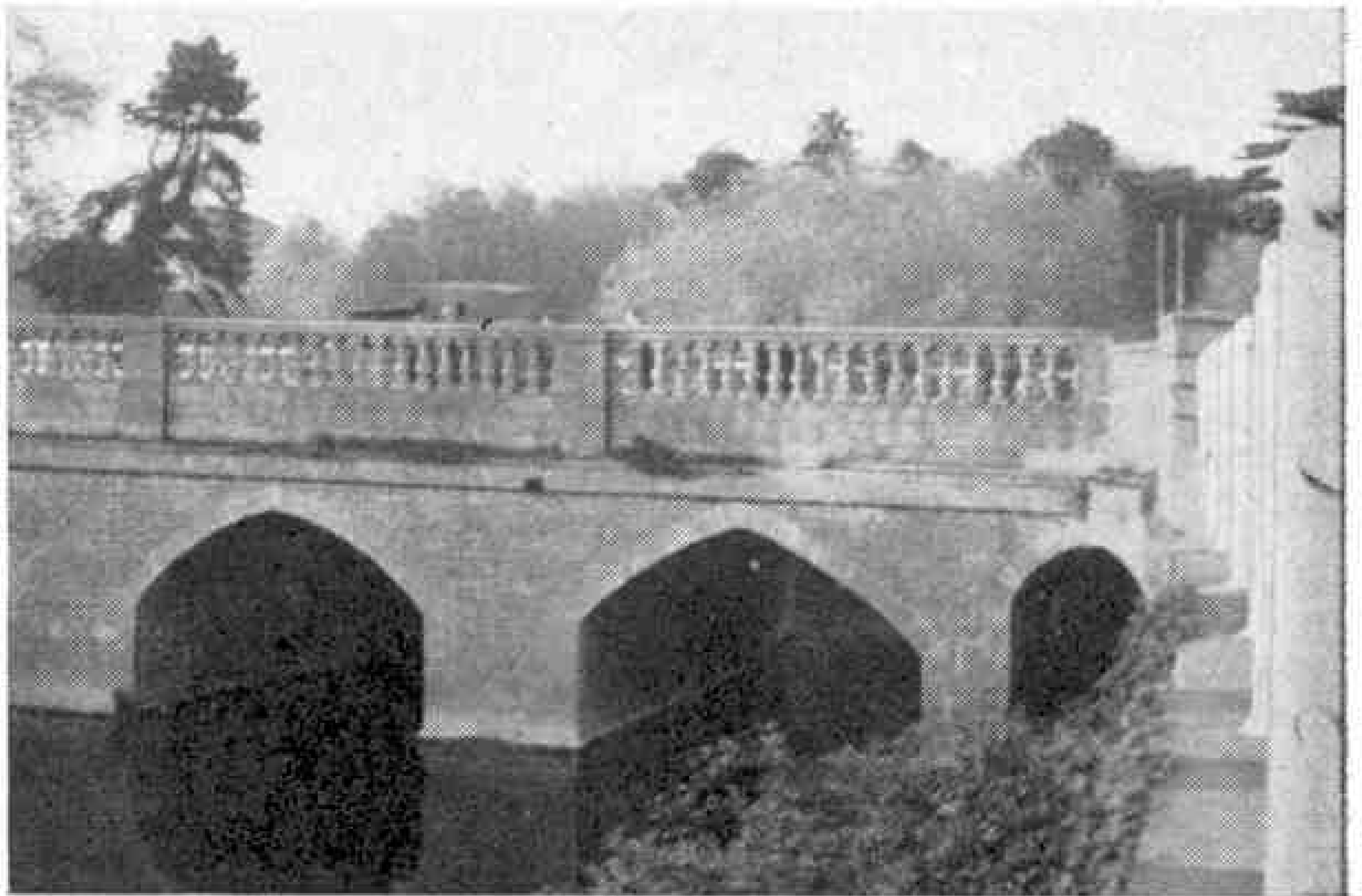
The illustration at the head of the page is a view of old Stirling Bridge, which is nearly 600 years old. It remained the chief crossing of the Forth until a new bridge was built just below it in 1831.

bridge and replacing it with a completely new one, a course that was followed by some eighteenth and nineteenth century iconoclasts. The result has often been far from pleasing. For instance, the present bridge at Rochester is quite out of keeping with its setting. In more than one case the new bridge has given less satisfactory service in point of durability than the old. In other cases, the rebuilt bridge has in its turn proved inadequate for its burden, and a policy that might contemplate rebuilding a bridge every century or so would hardly be economic.

In the circumstances, bridge engineers and authorities have differed in the means taken to augment, but preserve, the older structures. In the eighteenth century at least one bridge, the long crossing of the Avon at Chippenham, Wiltshire, was enlarged by building on the top of the mediæval one. Curiously enough, though the old bridge was said to be dangerous, it has stood up well to the strain. The result is that, seen from above, the bridge is a typical example of a balustraded eighteenth century one; it is not until one looks under it that one realises that the mediæval arches are still there, though covering a width of some

twelve feet or so, against the present forty feet width of the bridge. The original widening took place in 1758, followed by fresh work in 1796, when the balustrading was added, and in 1878.

A more usual practice in England was



Chippenham Bridge, Wiltshire, an example of enlargement by building on top of a mediæval structure.

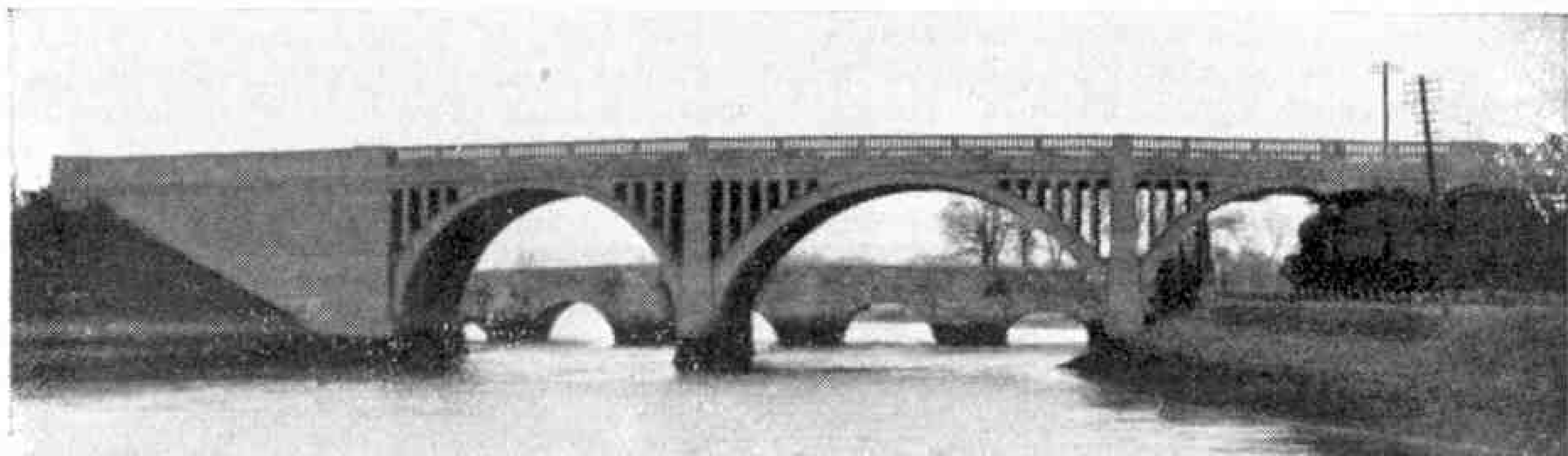
to widen one or both sides, either by corbelling out the bridge extension as at Bideford, or by rebuilding out over the old cutwaters, as was done for instance at Fordingbridge, Hampshire, and at Sturminster Newton, Dorset. Usually, one side only was "pushed out," leaving the other side an unspoilt example of mediæval work, with cutwaters and pedestrian recesses. This one-sided widening was adopted for part of Huntingdon bridge, probably the finest mediæval bridge in England.

If carried out in similar stone to that of the original structure, the result of such work can be quite satisfactory. It is not so satisfactory when brickwork is introduced into a stone bridge. One of the bridges at Dorchester, mentioned by Thomas Hardy in *The Mayor of Casterbridge* as the resort of the down-and-outs, though a brick bridge of no great age, has been widened on one side, leaving the groove kicked out by the feet of the human derelicts still visible on the other parapet.

Other methods that have been adopted of late are to divert the footpath outside the parapet of the bridge and throw the complete width of the bridge itself—or the width minus one footway only—into the roadway, or to build a separate footbridge alongside the road bridge. These methods have their utilitarian



Old Haddington Bridge, preserved as a foot crossing.



A seventeenth century bridge seen through its concrete successor built nearly 20 years ago. It is at Redbridge, near Southampton.

advantage as emergency measures, but completely spoil the appearance of a good-looking bridge on the side to which the excrescence is attached. In the case of the modern canal bridge at Fleet, Hampshire, with its steel tubular annexe, there is nothing to spoil!

Scotland, with its many picturesque bridges, though comparatively few of any age or historic significance, has shown the way to preserve those she has without impairing the structures. Such grand old bridges as those at Haddington, Stirling, Dumfries and Ayr, as well as the famous but now somewhat tourist-baited Brig o' Doon, have been preserved intact as foot or byway crossings, but are supplemented by a nearby bridge to take the heavier traffic. Incidentally, and accidentally, this gives the would-be photographer an excellent stance from which to get a pleasing picture of the older sister. This point did not seem to be realised by the denizen of Ayr who, local-like, did not appreciate the interest of the Auld Brig, and told me that if I wanted to photograph the swans on the river, I would get a better view at the other end of the modern bridge!

Of course, there are cases where the siting of the bridge is such that no alternative nearby crossing is suitable or possible, a point that had governed the siting of many old bridges at fords, which they have superseded, or on precisely the same site as that of a former bridge. There is generally a little latitude, though, and even London Bridge does not run on exactly the same course as the old one, the approach ramp to which still exists a little way to the east of the present bridge.

In recent years some old English bridges have been relieved in this fashion. At Redbridge, near Southampton, a concrete bridge built in the nineteen thirties forms a frame

for a good view of its seventeenth century predecessor—a view that can only be had, however, from the Southampton-Bournemouth railway line. Twenty odd miles away, Iford bridge, on the Bournemouth-Christchurch boundary, over the Dorset Stour, has been closed to vehicular traffic, but remains as a pedestrian crossing, while the main road traffic is carried by a brick bridge, the arches of which are too low to give the same effect as at Redbridge. The old bridge itself, in this case, is a patchwork of seventeenth to nineteenth century work.

A bridge that should and may be bypassed in this manner is Wool Bridge, Dorset, a picturesque but badly treated bridge almost under the shadow of the Jacobean Manor House of Hardy associations. May heaven preserve those of us who love old bridges, though, from such an atrocity as the placing of a steel girder bridge beside the mediæval bridge at neighbouring Holme.



A tubular steel footbridge built beside the old canal bridge at Fleet, Hampshire.

From Ballinluig to Aberfeldy

A Picturesque Scottish Branch Line

By Alasdair Riley

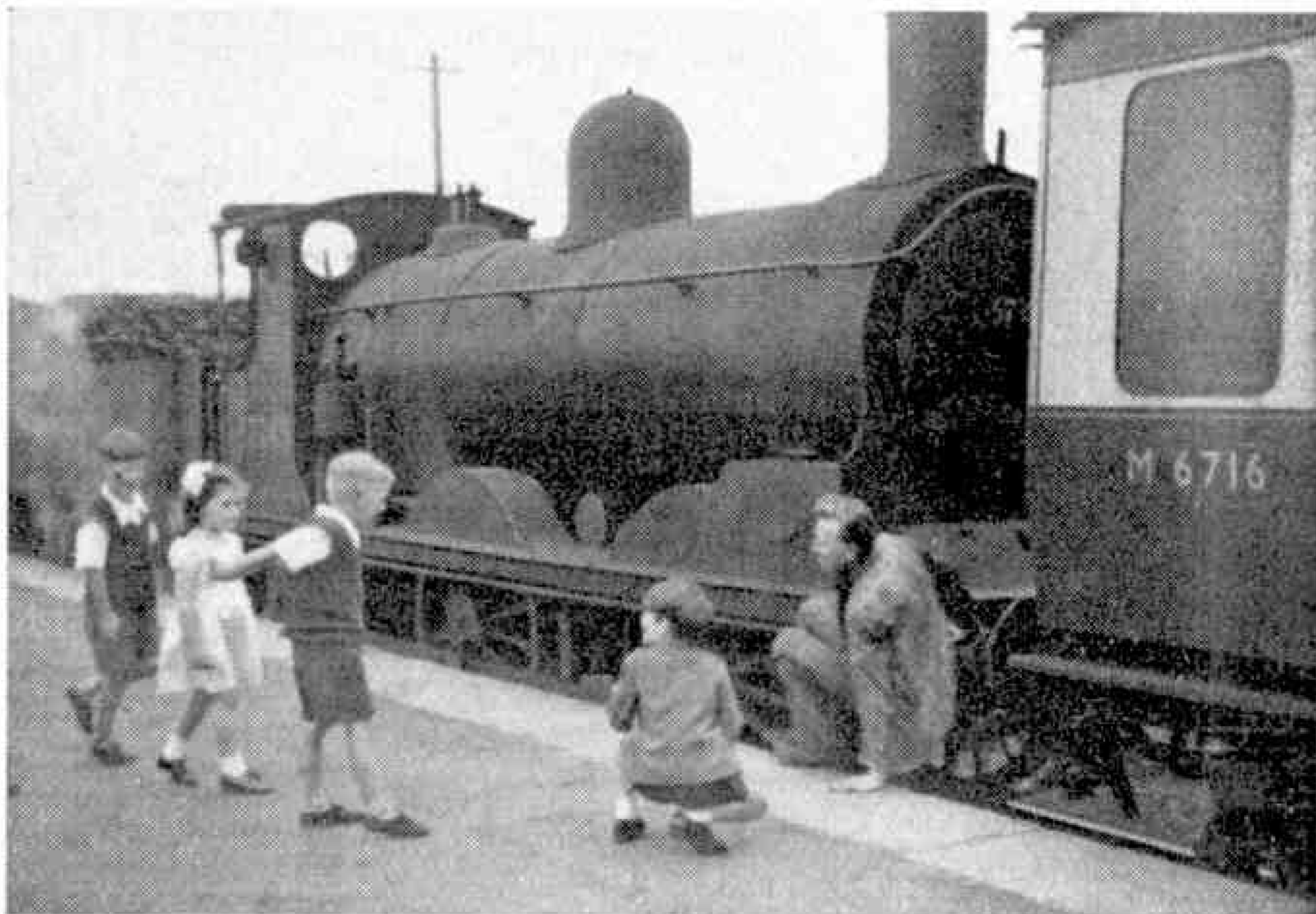
ONE of the most interesting stations on the old single-track Highland Line from Stanley, near Perth, to Inverness is Ballinluig. From it a short branch line runs west to Aberfeldy. This miniature railway system, yet another of those now threatened with closure, threads its way along fertile Strathtay, and like its bigger brother controls its traffic by the transference of tokens. Normally there are only five trains each weekday except on Saturday, when there are seven and none on Sunday. If, as is usual, there is only "one engine in steam," the driver receives a large brass key from the signal box at the beginning of his journey with which to open the points at the other end. Without this key he cannot return. On the rare occasions when more than one engine is at work the signalman changes over to the "tablet" system whereby the necessary tokens are picked up automatically from apparatus at the track side.

The locomotive that usually pulls the two coaches is a 2-4-2 tank known locally as the Coffee Pot; but our picture shows the more interesting engine that ran at intervals during the summer months of last year. This is a veteran 0-6-0 tender engine, B.R. 57345, built at St. Rollox, Glasgow, in 1892 and is still giving yeoman service after 60 years.

Driver Duff, who is seen in our photograph, served his time on the Macduff branch line, but came to Ballinluig in September 1951 when his old line closed down. His first train of the day, the 10.25 a.m. from Ballinluig, waits for the Perth train, from which it often receives in addition to passengers a couple of goods wagons and a brake van before the very

mixed "Ballinluig-Aberfeldy Special" sets out on its way.

The line is very picturesque. Almost immediately it crosses first the river Tummel, then the Tay, in each case by one of the castellated girder bridges that are so characteristic of railway construction in this part of the country. Thereafter the line keeps to the right bank of the Tay, stopping for a moment and a chat at



Young enthusiasts watch Driver Duff as he climbs back on the platform at Aberfeldy after re-coupling his veteran 0-6-0 for the return trip to Ballinluig.

the two intermediate stations, Balnaguard Halt and Grandtully. The whole run is a delightful one through rich wooded country and throughout the train is never far from the salmon-haunted Tay.

There is no turntable at either Ballinluig or Aberfeldy. For this reason the engine must return in reverse, and that is a good reason for the preference for a tank engine on the line. In bad weather Driver Duff unrolls the tarpaulin cover from the cab of his engine, and stretches it over to the tender in order to protect him from the elements. On the whole, however, driving on this attractive branch line is a pleasant life, and it will be a sad day when the Coffee Pot and Driver Duff's six-coupled veteran make their last run along the line connecting Ballinluig and Aberfeldy.

Mobile Cranes at Work

How they Speed Loading and Handling

THE ancient Egyptians are much to be admired for their contributions to the seven Wonders of the World in the form of the Sphinx and the Pyramids. The ambitious Cheops created the largest of the Pyramids many, many years before the birth of Christ, and his slaves had nothing but winches and rollers with which to create their mighty and imposing structure, except the valuable ally of time. They had indeed lots of time in which to complete the work, as well as plenty of manpower.

Nowadays time is a very important

A Jones KL66 mobile crane at work. For the illustrations to this article, and for that reproduced on our cover, we are indebted to K and L Steelfounders and Engineers Ltd.



factor. The saving of time means the saving of money and for this reason mechanical handling equipment has become increasingly necessary to the industrialist and the contractor, and to municipal and port authorities and the like throughout the world. A very important contribution to mechanical handling is made by the mobile crane, and in the countryside of Hertfordshire K. and L. Steelfounders and Engineers Limited make a series of these, which are known as the Jones KL Mobile Cranes. These cranes are the product of many years of research into handling problems,

and they and others like them have become such a fundamental necessity to industry generally that without them it would not be possible to achieve the speedy distribution of food, raw materials and other commodities essential to our national life.

Imagine the hubbub and activity in a great seaport where cargo vessels are being loaded and unloaded by the great portal cranes that form the unmistakable sky-line of any important system of docks. It is the job of the mobile crane to distribute the cargoes off loaded by the portal cranes, as well as to perform countless other handling duties on which the smooth running of the docks and the quick turn-round of vessels so much depends. Their high mobility enables them to travel around picking up merchandise here and there for eventual shipment abroad or, in the case of imports, for storing the countless items we buy from abroad in the port's warehouses.

The mobile crane will also be found helping with the construction of the many new housing estates and towns being developed throughout the country. The larger cranes with their long lattice jibs are able to hold roof trusses in place, and they can put into position the whole

side of a pre-fabricated house in one concerted movement. This is a job that would take perhaps many hours to complete without the valuable assistance that this type of crane can give.

Britain must export! We have shown you how the mobile crane greatly improves handling facilities at our docks, but in addition they themselves are shipped abroad to earn valuable foreign exchange for the Exchequer. KL Cranes can be found in almost any country in the world; they can be seen handling logs and timber in Sweden, working on public utility undertakings in the Argentine, grabbing



Another mobile crane in the K and L range is the Jones KL44 type shown here. This and the KL66 crane shown on the opposite page can be mounted on crawler tracks.

bauxite in Yugoslavia, handling sugar cane in British West Indies, working in Norwegian docks, and doing a diversity of other duties in Holland, Belgium, France, Spain and Africa, as well as in Brazil and other South American countries. They also give valuable handling assistance in Greece, Japan, Turkey and, in fact, in most other countries that one can call to mind.

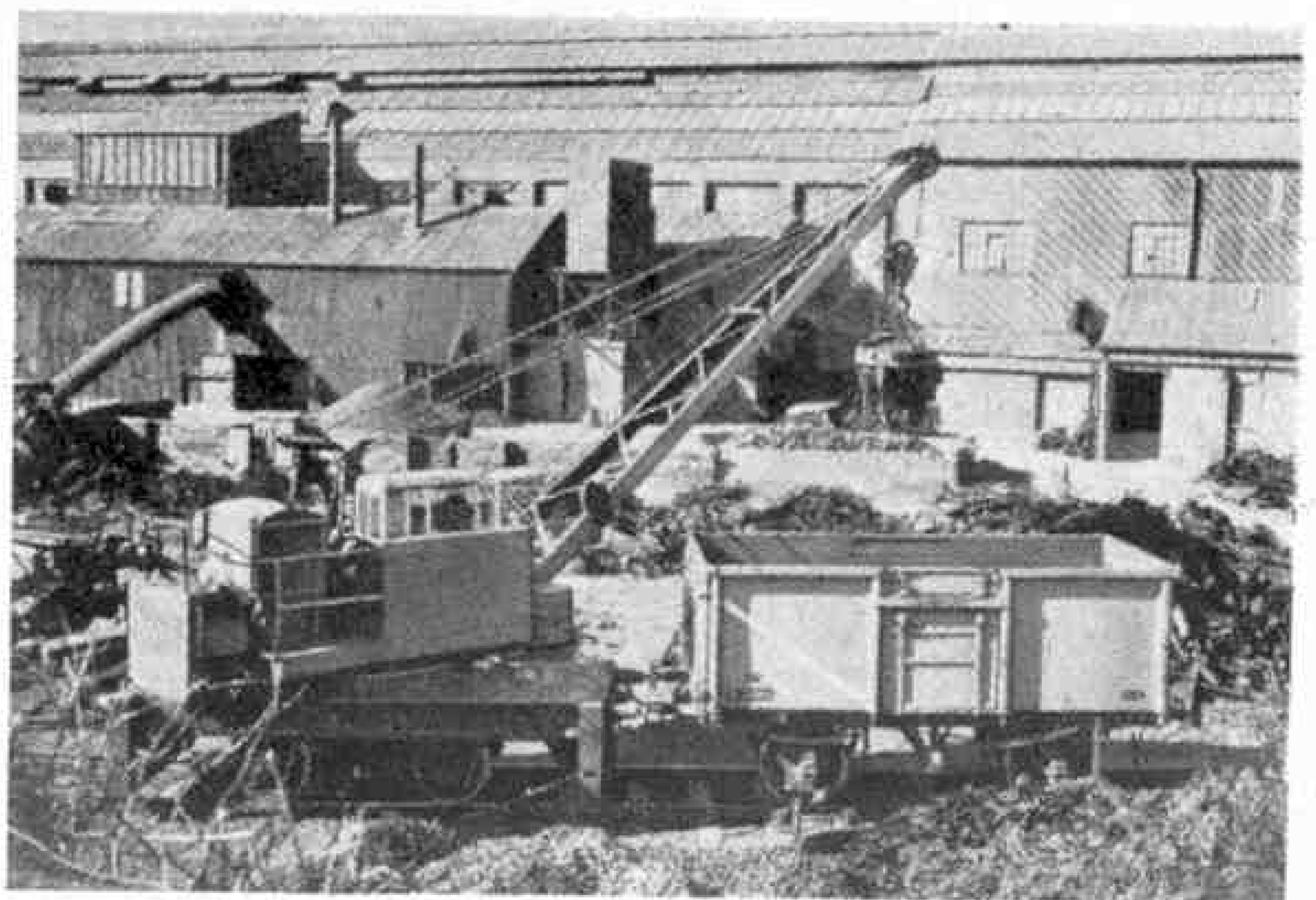
K and L Steelfounders and Engineers Limited are particularly proud of their Jones KL66 Mobile Crane, which is illustrated on the opposite page. This has a maximum capacity of six tons with its 20 ft. centres swan-neck lattice jib at a radius of nine feet. It can travel with this load and at the same time it can, if need be, slew its superstructure in a complete circle in either direction and derrick its jib up and down as well as hoist and lower the actual load. You can see, therefore, how valuable is this machine and how much time it can save.

The KL66 has a four-wheel drive through a special differential. Like all KL

Cranes, its wheels are of the steel restrictor ring type, which give additional bearing area on ground having a soft top surface, as well as stopping the crane from tipping over should a blow-out occur under load. There is also a device in the crane that automatically corrects the steering to allow for the position of the superstructure. In other words, when the crane jib is facing the rear of the crane, the crane operator still turns the steering wheel to the left when he wishes to travel to the left and to the right when he wants the crane to turn to the right.

Another interesting crane is the KL100 diesel rail shunting crane. This machine is a development of the old steam crane; on pressing a button the diesel engine starts and the crane is ready for immediate use. When the job is done the engine is switched off without further waste of fuel. The KL100 can lift five tons with jibs up to 40 ft. in length at a radius of 16 ft., and it can shunt 180 tons.

The other cranes making up the KL range are the KL15, a small 15 cwt. machine, and the KL22 and KL44, which lift two and four tons respectively with jibs up to 24 ft. centres at a radius of 8 ft. For users who need to work a crane between scattered sites, and thus require a high travelling speed, most of the KL Cranes can be mounted on a lorry chassis for speeds up to 20 miles per hour or more; the normal road speed of a self-contained mobile crane is about four to six miles an hour. In addition the KL Cranes can be used with various types of grab and also an electric magnet. You will see therefore that they can give very comprehensive range (*Continued on page 222*)



The Jones KL100 rail shunting crane.

"Battling Bantams"

Light Ground Attack Aircraft

By John W. R. Taylor

AIR warfare is putting on weight at such alarming speed nowadays that aircraft designers, pilots, air force commanders and even the Treasury are becoming more and more worried. During the 1914-18 War, a fighter 'plane like the Sopwith Pup, complete with its pilot, fuel and armament weighed barely half a ton. Today, the guns and rockets carried by the average single-seater alone weigh more than that; while a modern two-seat all-weather fighter like the Javelin can easily weigh more than a fully-loaded Dakota air liner. As for the cost—which is where the Treasury comes in—it would not be unreasonable to estimate the price of a Javelin as around 20 times the £5,000 we reckoned as the cost of a Spitfire in Battle of Britain Fund days, 12 years ago.

Bombers are just as bad, because present-day "heavies" like the American B-36D or B-52 each weigh as much as two whole squadrons of Handley Page 0/400 heavy bombers of 1918. Their K.1 radar bomb-sights each weigh more than a ton, and cost £90,000, while the complete cost of the prototype B-52 was a mere £7,500,000!!

It is easy to laugh at such figures, and recall the old, true saying that "Figures are like soldiers; they can be made to form fours at will." But the Air Marshals are not laughing, because even Britain cannot afford many Valiants at £350,000 each, and they are the cheapest of Britain's three super-priority big bombers.

Much of the cost and the weight of modern warplanes results from the mass of operational equipment they have to carry. A fighter needs radio and radar to guide it to its enemy and bring it safely home, a radar gun-sight to ensure accurate fire at speeds around 600 m.p.h., radio altimeter, oxygen equipment and a pressure cabin for high-altitude flight,

cockpit heating and refrigeration, de-icing equipment, camera-gun, automatic identification radio and a score of other devices. A big bomber carries anything up to 25 radio and radar installations as a start.

The combination of great weight and high speed means that a fighter, instead of "turning on a sixpence" like the old, lightly-loaded biplanes, needs about 20 miles of sky in which to make a complete turn. So the average fighter pilot gets only one chance to shoot down an enemy bomber, because by the time he has turned for another attack the bomber has usually disappeared.

The aircraft designer is harassed because, despite the weight and bulk of all this



Refuelling a North American T-6 after its return to the advance fighter strip following a successful mission. Official U.S. Air Force photograph, released by Department of Defense.

equipment, and hundreds of gallons of fuel for the thirsty jets, he is still expected to produce a compact, "clean," ultra-fast aeroplane.

Nor are the super-complex, super-fast warplanes as efficient in every way as their older, slower counterparts. The Korean War proved this fact. Rocket-firing jet fighters were perfectly satisfactory for attacking enemy troops and tanks when the latter were out in the open. But if the enemy were well camouflaged or dug in, the jets had no time to look for them



Fletcher FD-25 baby bomber. Photograph by courtesy of Fletcher Aviation Corporation, U.S.A.

and get away before the enemy realised what had hit him? If so, such aircraft could be built quickly and easily, from non-priority materials, at a fraction of the cost of a jet fighter, and could be flown by any pilot of average physique and skill, leaving the super-fit, highly-trained youngsters free to fly interceptors and bombers.

It was no new idea, because the Russians used hordes of tiny U-2 stick-and-string biplanes to attack the Germans by night with small bombs during the last war; and U.S. Army units in Italy tried fitting rocket-launchers to their Cub spotter-planes until they were told that the

and make completely sure they were not attacking friendly troops, because their fuel was being burned so very quickly. So, for close support of United Nations ground forces, the U.S. Marines in their piston-engined Corsair fighters have again achieved the greatest reputation.

Not to be outdone, the U.S.A.F. pressed into front-line service squadrons of veteran, two-seat T-6 (Harvard) trainers in July 1950. The purpose of these "mosquitoes," as they called them, was to stooge around slowly, looking for targets and, having found one, call up a flight of rocket-firing jets and then dive steeply to indicate the target with a white phosphorus marker-rocket.

One day an enthusiastic T-6 pilot marked his target—a Communist armoured self-propelled gun—so well that it required no further attention from the jets. Back in the Pentagon in Washington, the incredible headquarters of the U.S. Armed Services, a few bright Army and Air Force officers heard of this and began to wonder if his success was not more than a mere lucky hit. Was it not quite feasible, they argued, that a light aeroplane, carrying rockets or napalm jellied-petrol firebombs, could sneak in at a target, make a quick, accurate attack,

Air Force had a monopoly on warplanes. Furthermore, both Temco and the Fletcher Aviation Corp. had already considered designs for "baby bombers" by the Autumn of 1950.

The exploits of the Korean "mosquitoes" finally proved the practicability of the idea, and Fletcher were given a contract to produce a prototype light ground attack aircraft. Simultaneously, Temco modified the design of their projected T-35 basic trainer, so that it could carry guns and rockets, and achieve a dual role as trainer or infantry support aircraft. The results were the Defender and Buckaroo, both of which are illustrated on this page.

In general, they follow the same broad lines. The single-seat FD-25 Defender



The latest version of the Temco T-35 Buckaroo. Photograph by courtesy of Temco Aircraft Corporation, U.S.A.

has a wing span of 30 ft., weighs 2,500 lb., has a 225 h.p. Continental engine, top speed of 187 m.p.h., range of 630 miles at 162 m.p.h. and can carry two 40 gal. napalm tanks, two 250 lb. bombs or 40 small rockets in addition to two machine-guns. The FD-25A is similar, except that it carries a second crew-member behind the pilot, for observation, liaison, attack or training duties.

The two-seat Temco T-35 Buckaroo spans 29 ft. 4 in., weighs 1,975 lb., has a 165 h.p. Franklin engine, top speed of 156 m.p.h., and can carry two guns, plus ten small rockets. Its aluminium-alloy construction is more orthodox than that

ordered by the U.S. Air Force for supply to European countries under the M.D.A.P. scheme, and the Japanese have bought the licence to build Defenders.

Meanwhile the French have in their two-seat Fouga Magister, which is powered by two 880 lb. thrust Turbomeca Marbore baby turbojets, an ideal dual purpose trainer-light attack type. In addition, they are developing a little two-seat piston-engined "pusher" type called the Potez 75 specifically for ground support.

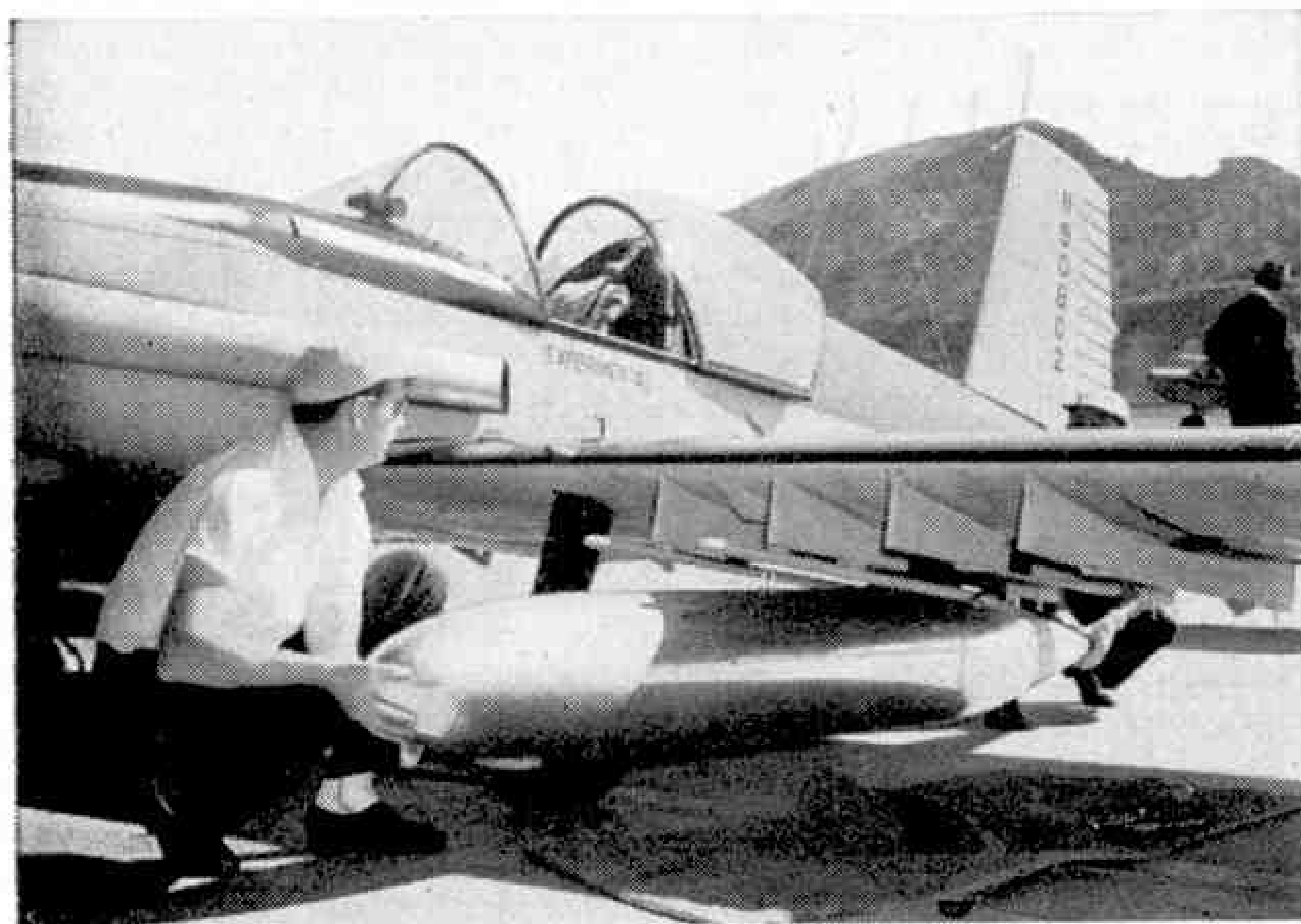
Little can be written about plans for British "Bantams," except that Folland Aircraft are building a private-venture lightweight supersonic fighter, with a

specially-developed turbojet engine, in an effort to prove that highly-efficient first-line interceptors can be produced at half the cost and weight of current types. They have received little official encouragement so far; but the Japs proved with their Zeros in 1942 that a lightly-loaded, lightly-armed fighter can often make rings round more heavily-armed and more powerful types. The Russians have followed the same formula with the MIG-15.

The ultimate development of this type of aircraft is a tiny target defence interceptor like the wartime experimental

German rocket-propelled Bachem Natter. This fighter was designed to be shot vertically off a ramp as soon as an enemy bomber came in sight. Climbing at fantastic speed, it would remain under ground radio control until within range of the bomber, when its pilot would take over, aim and fire his rocket armament. Pilot and engine were then supposed to descend by parachute, leaving the cheap, easily built airframe to crash.

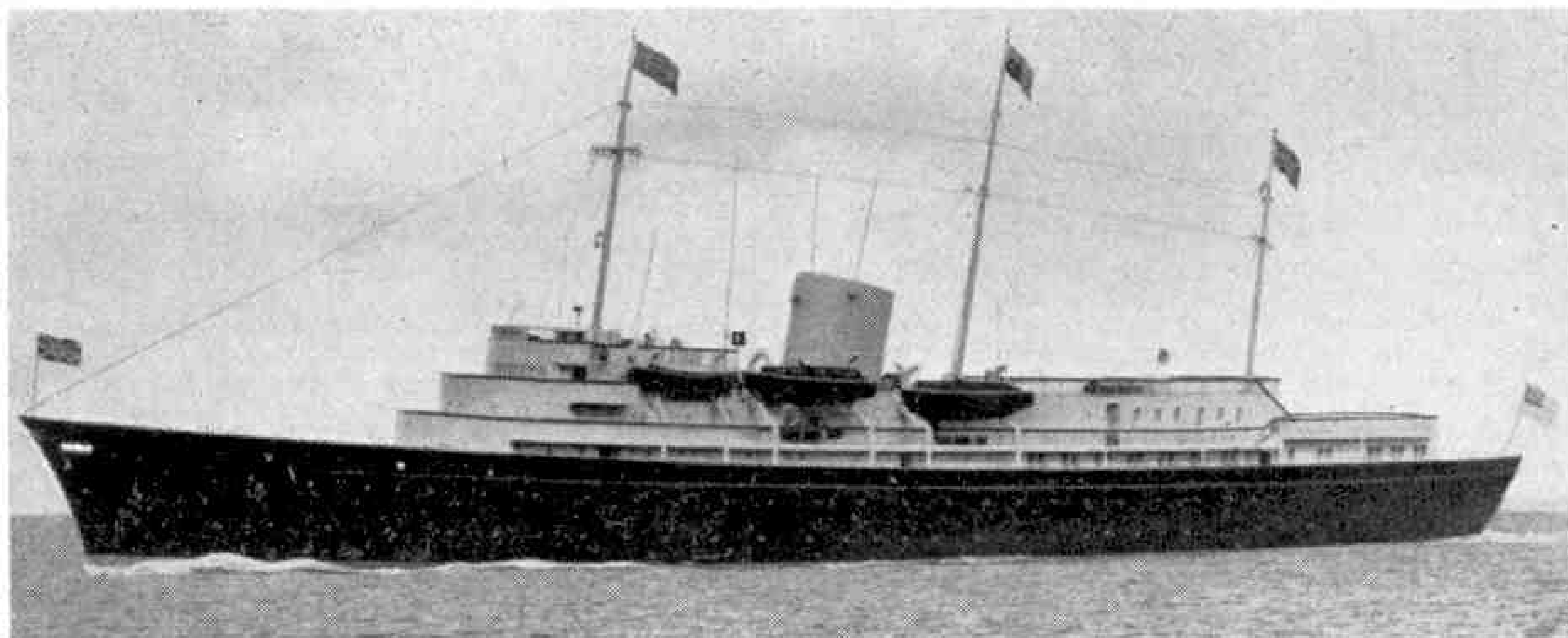
It seems certain that Fighter Command would welcome squadrons of cheap, high-performance, lightweight interceptors of this type to back up its big, complex, expensive Javelins, just as much as the Army would welcome swarms of Defenders or Buckaroos as highly-mobile flying artillery. So we are likely to hear a lot about "Battling Bantams" in the next few years, until both jobs are taken over by guided rockets.



Loading a napalm tank on to a Fletcher FD-25 baby bomber. Photograph by courtesy of Fletcher Aviation Corporation, U.S.A.

of the all-magnesium Defender, which was designed to make use of materials not required for other warplanes. In addition, it has more "frills" than the Defender, including a retractable undercarriage, which makes it perhaps more useful as a trainer, but more complex to build and service. Of paramount importance is the fact that both aircraft can fly very slowly—the Defender at a speed as low as 35 m.p.h.—for observation and target identification, and they are manœuvrable enough to dart quickly out of danger after attacking.

They are the finest examples so far of the sort of "Battling Bantams" that air forces and army units may be forced to buy in the next few years to keep down costs of warplane production and pilot-training; and there is little doubt of either their value or operational efficiency. In fact, the Buckaroo has already been



The Queen's New Yacht

By Arthur Turner

WHEN the Queen launches her new state yacht at Clydebank this month, she will give a royal send-off to a 4,000-ton vessel that is to serve not only as a cruising yacht in peacetime, but also as a hospital ship in the event of war. This new single-funnelled ship, 413 feet long and with a beam of 55 feet, is to replace the old *Victoria and Albert III*, built in the late nineties and sent to the scrapyard a few months ago.

The keel of the new vessel was laid last June, and she is expected to be ready for commission by the end of this year. Merchant ship practice is being followed in her construction, but she is being built to plans supplied by the Admiralty. She will, in fact, eventually be attached to the Royal Navy and will be manned by R.N. personnel.

With a modified cruiser stern and a raked bow, she will have the royal and state apartments in the after part, and the accommodation for the ship's officers and crew will be in the forward section.

The most remarkable feature will be the arrangements for converting the vessel into a hospital ship if the need arises. She has been so planned that this can be effected with little structural alteration. The royal and state apartments would be transformed into hospital wards and operating theatres, for which air conditioning is being installed. The after end of the shelter deck will be strong enough for a helicopter to land on it with patients.

The fine vessel modelled at the head of the page is intended to serve a double purpose. When completed she will be the new royal yacht, to replace the former *Victoria and Albert III*, but has been so constructed that in the event of war she can be converted into a hospital ship.

Steam turbines fed by two boilers will drive twin screws and give the yacht a cruising speed of 21 knots, and she will have a stabiliser to reduce her roll in bad weather, as well as radar equipment to assist in her navigation.

The name of this fine-looking yacht of course will not be announced until she is launched. If she is christened *Victoria and Albert* she will be the fourth British royal yacht to bear that name. The first was a paddle steamer launched in 1843; the second, also paddle-driven, was launched in 1855, and the older vessel was then renamed the *Osborne*.

The *Victoria and Albert III*, recently scrapped, had an unusual career. For fifty years she was the only yacht in the Navy List. Though she was built expressly for Queen Victoria, and was fitted with refinements that made her unique, Her Majesty refused to sail in her, for owing to an error in the measurements the vessel assumed an alarming list soon after she was launched. The fault was rectified only by reducing her superstructure, cutting 20 feet from each of her two funnels, and introducing 600 tons of concrete into her hull!

Despite this handicap she served right royally for many years, becoming a familiar sight during Cowes Weeks, naval reviews, and other important maritime events. Her successor will cost roughly £1,000,000 and as a dual-purpose ship she will be an asset to the Fleet as well as a state yacht for the Queen.

Railway Notes

By R. A. H. Weight

Farewell to the Canterbury and Whitstable Line

Since 1930 the steeply graded 5½-mile branch from Canterbury, West, to the coastal Harbour station at Whitstable has carried only goods traffic, for which one daily train had recently sufficed. At the end of last November the announced final journeys were made, as it had been decided to abandon the branch, though it was reopened temporarily for coal as an emergency measure when the Kent coast main line that passes through Whitstable on another level was breached during the severe storms and flooding from the sea, which did so much damage in February.

The line had great claim to fame as the first railway in the world to carry ordinary passengers in steam-hauled trains. This service began in May 1830, shortly before the opening of the longer Liverpool and Manchester Railway in the same year. It was probably the first to issue season tickets. Its primitive pioneer 4-wheeled locomotive *Invicta*, still to be seen in public gardens at Canterbury, was the earliest having outside cylinders at the leading end, though these differed greatly from present practice. This engine was not very powerful, however, and in early years had to give way to stationary engines with cable or rope haulage on the steep sections, there being climbs as severe as 1 in 28, 41, 49, etc. The narrowness of the 828-yd. Tyler Hill tunnel on the initial rise out of Canterbury meant that only very small rolling stock could be used, not providing much comfort, so that was one of the reasons why passenger services were discontinued over 20 years ago.

The engines of the former South Eastern small 0-6-0T type as exclusively used in recent years of class R1 have a cut down stove-pipe chimney in order to clear the small bore of the ancient tunnel. The lower illustration on the opposite page shows one of the branch freight trains during the last summer of its regular operation.

Southern Tidings

Four large 4-4-0s of class L1, numbered 31786-9, were recently transferred from Ashford to Eastleigh Depot whence all the older L class engines meanwhile returned to the Eastern Section. Nos. 31762 and 31766 of the latter type moved to Guildford. No. 76005 was allocated to Eastleigh, as the first of a series of new B.R. class 4 2-6-0s arriving on the S.R. Latest diesel shunting locomotives at Hither Green include Nos. 13010-14. Electric and diesel-electric main line locomotives have recently been repaired at Brighton Works, together with diesel shunting engines.

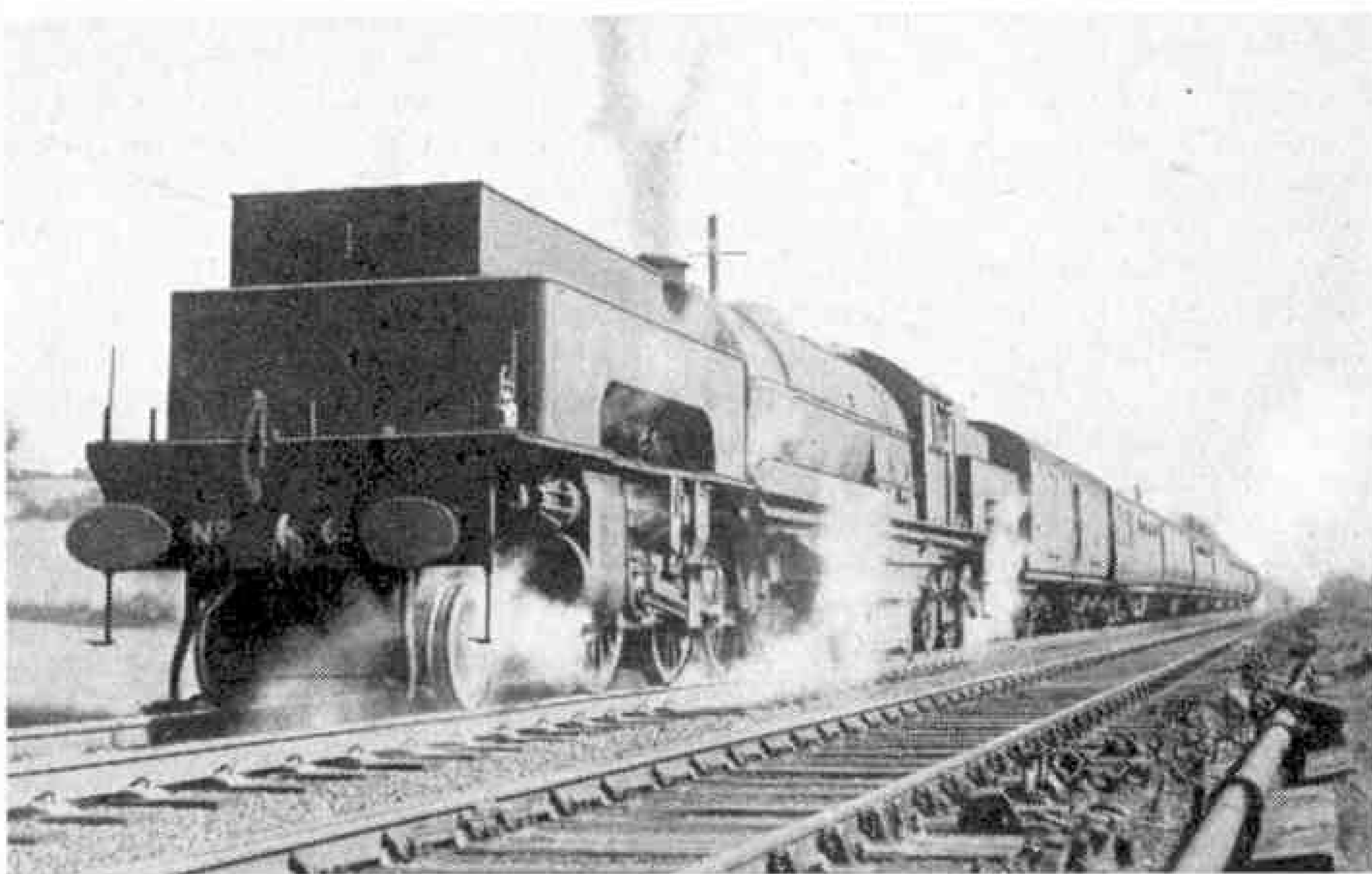
M7 0-4-4T No. 30027 hauled special trains making what were probably the last journeys over the Bisley branch, which had for many years been used only during rifle shooting meetings and is now to be

abandoned. The passengers were enthusiasts travelling under the auspices of the Railway Correspondence and Travel Society, which chartered a special run from London to Brookwood (Surrey) and back, headed by the 69-year old Adams 0-6-0 No. 30577. The route was an unusual circular one beginning at Waterloo and ending at Victoria.

It is most unusual for one of the E2 class, the last L.B.S.C.R. type of 0-6-0 shunting tank to be built, to work a train over any distance. But No. 32108, built in 1916, when on passage from Eastleigh to Dover hauled a freight train alone from Eastbourne to Hastings, then went forward coupled to Q1 0-6-0 No. 33027, double-heading a Hastings-Ashford goods next morning.

S15 4-6-0s stationed at Feltham have been working freight trains between Chichester and Brighton, returning to the Western Division via Fratton. Among locomotives withdrawn are more representatives of the D15 and T9 4-4-0s, and of the D3 and R1 0-4-4Ts. Schools class engines normally shedded at Ramsgate and Dover have been among those working from St. Leonards temporarily while home locomotives were in works.

In order to provide the shortest available route between Faversham and Ramsgate while the main line through Herne Bay is being restored and the sea wall reconstructed, the wartime tracks connecting the Faversham-Canterbury East line with that from Ashford to Canterbury West and Minster have been restored, with new double line junctions and signalling. London-Kent Coast expresses began running that way on 23rd February.



E. R. Beyer-Garratt Locomotive No. 69999 when on loan experimentally to the L.M.R. for banking duties on Lickey Incline. The engine is now an oil burner. British Railways Official Photograph.

Australian Railway News

I have recently been pleased to receive two copies of the Bulletin published by the Australian Railway Historical Society which circulates monthly among its members and friends.

On the same day in October last that I travelled with a large party of enthusiasts behind notable ex-L.B.S.C.R. locomotives between London, Brighton and Kemp Town, in celebration of the Brighton Works centenary reported in the January *M.M.*, there took place the Australian Society's annual outing by special train from Sydney. This train was formed of two clerestory-roofed cars of typical American late 19th century design, headed by a veteran 4-4-0 with inclined outside cylinders, No. 1231, which had first entered service as 48N on the Great Northern Railway at Newcastle, New South



A special train approaching Golborne Junction L.M.R. The engine is Jubilee 4-6-0 No. 45592 Indore. Photograph by A. G. Lawson, Liverpool.

Wales, in 1880. The driver, fireman and guard were attired in the style of the 1890's. The locomotive crew had a hard day on the round trip as some very steep gradients were encountered. I learned that it was all much enjoyed and created great interest, on a beautiful early summer day, which was in striking contrast with the damp chill and mist in England on the same date.

Mention is made of the main line electric locomotives in course of delivery to the Victorian Railways from the works of the English Electric Co. Ltd., Stafford; and also of their new fleet of 1500 h.p. diesel-electric ones under construction by the Clyde Engineering Co. Ltd. of Clyde, N.S.W., with descriptions of impressive trial runs, as well as much other past and present information of interest.

A Miscellany of British Railways Announcements

Beginning in April, especially cheap 8- or 15-day excursion tickets will be issued between London, Edinburgh and Glasgow on Friday nights, with advance bookings and guaranteed seats in the *Starlight Special* trains, formed of corridor stock with refreshment service, operating between St. Pancras and Glasgow (St. Enoch), and between Marylebone and Edinburgh (Waverley), the latter following a somewhat unusual route south of York.

A new type of mobile track sweeper constructed in America has been ordered. It is powered by a 100 h.p. petrol engine that can be handled by one man, and is mounted on six rubber-tyred wheels. It can travel astride, alongside or across railway tracks, and should greatly expedite the process of sweeping up cinders, stones or other materials dropped in sidings. It should also prove useful in clearing snow.

Our railways have more than 18,000 locomotives, which run

nearly 500 million miles per annum, and over 80 per cent. are on the average available for traffic at any one time. They are also becoming more efficient as regards coal consumption and higher mileage between repairs.

A Railway Travel centre is to be opened shortly on a central site in the West End of London in Lower Regent Street. It will have extensive window displays, a cinema projector, enquiry counters and every facility for ticket sales and reservations by all British, Irish and Continental routes. It will take the place of four existing smaller offices.

More "Britannia" Class Locomotives

Crewe Works has been turning out class 7 Pacifics at a fairly rapid rate. Those on the L.M.R. lately placed in service are Nos. 70030 *William Wordsworth*, which was engaged in February on express braked coal and other Midland Division trials; Nos. 70031-2, respectively named *Byron* and *Tennyson*, recently on loan to Edge Hill shed, Liverpool, then at 9A, Longsight (Manchester); No. 70033 *Charles Dickens* allocated to Holyhead and also seen on other duties; and No. 70034 *Thomas Hardy*, 9A. No. 70031 *Byron* when hauling a heavy 16-coach load weighing about 540 tons in all, forming the *Merseyside Express* non-stop from Liverpool to Euston in charge of a Camden crew, made an excellent run, regaining 8 min. late start.

On the Eastern Region at Norwich shed is No. 70035 *Rudyard Kipling*, and Nos. 70036-7 named *Boadicea* and *Hereward the Wake* respectively, stationed at Stratford, with others following. Engines of this type running-in have been seen in the Midlands, the North and North Wales.

B.R. Spotters' Code

British Railways (North Eastern Region) have recently issued an interesting poster for the benefit of loco. spotters. This gives a welcome to the railway enthusiast, but asks him to keep to what is called the Spotters' Code, which consists of four simple safety rules: Always keep to the platform; Don't jump on parcels or mailbags; Make sure your viewpoint is a safe one; and leave barrows and railway equipment alone.

We are sure *M.M.* readers willingly follow these rules, the breaking of which may end in station platforms being closed to number takers, and indeed to all enthusiasts.



"Truly rural" would well describe this view of a goods train on the Canterbury and Whitstable branch, the oldest railway in the south of England. Photograph by J. J. Smith.

The World's Highest Waterfall

How the Angel Fall was Discovered

WE all love waterfalls. It is fascinating to see water tumbling down from almost any height, and even when it just rushes and ripples down a rocky slope we watch it with the keenest delight. No beauty spot indeed seems to be quite complete without a cataract of some kind, and if there is no waterfall near us we go to a great deal of trouble to make little artificial waterfalls in our parks and gardens.

While we take pleasure in small falls of this kind, we feel overwhelmed when

he was going to find as he came nearer to the source of the thunderous noise that drew him onward to the discovery. The Victoria Fall provides another example of the rush of a mighty mass of water, which in this case plunges into a deep gorge, sending up clouds of mist and spray that have earned for the Fall that native name of "The Smoke That Thunders."

As remote parts of the world came to be explored more thoroughly many other falls were discovered that completely

outshone Niagara as far as height is concerned, although none of them could rival those famous falls in volume. Among these the most widely known are the graceful falls of the Yosemite Valley, in California. The Ribbon Fall, in that valley, was long looked upon as giving the highest single leap in the world, a downward plunge of 1,612 ft. The Upper Yosemite Fall exceeds this in total by nearly 1,000 ft., but there are really two falls here, the water descending in two leaps, the highest of which is 1,430 ft. Both falls provide wonderful pictures, as the illustration reproduced on this page shows, and it is not surprising that this and its neighbour the Ribbon Fall have been a Mecca for tourists ever since the wonders of the Yosemite Valley were discovered.

From time to time stories of new waterfalls far higher than any already known have reached us from various parts of the world, notably from South America, where there are still vast areas to be explored. Mighty cataracts were discovered in the hinterland of British Guiana, notably the great

Kaietur Fall, which is remarkable for its volume of water and its height of 741 ft., which far exceeds those of Niagara and the Victoria Fall. Higher falls were revealed later in British Guiana. The highest of these is the Uitshi Fall, the waters of which plunge downward from a height of 1,200 ft. This waterfall has the



The graceful Upper Yosemite Falls, California. The lower fall is an unbroken leap of 1,430 ft.

we contemplate the great waterfalls of the world. Niagara was probably the first of these to be acclaimed as stupendous. It certainly deserves this description from the immense quantity of water that pours over its limestone edges with a stupendous roar, and its discoverer, Father Hennepin, must have wondered more and more what



A picturesque Mexican waterfall that is about 60 miles along a state road leading off the Pan American Highway between Valles and Victoria, to the south of Monterey. The illustrations to this article are from photographs by Ewing Galloway, New York.

distinction of being the highest single plunge in the British Commonwealth, and indeed there are today only three waterfalls in the world to have a greater height. Two of these are the falls in the Yosemite Valley. The third is the Angel Fall in Venezuela, the South American country that borders on British Guiana and Brazil.

The south eastern section of Venezuela, between the great river Orinoco and the frontier with Brazil to the south, is a country of mountain ranges and dense jungles that has long been considered inaccessible. It was there that the Angel Fall was discovered. In view of the nature of the country it is not surprising to learn that it was apparently first seen from the air, as long ago as 1935, by a pilot prospector named Angel, after whom it has been named.

Glimpses of it were caught at various times by other airmen, in spite of the fact that for much of the time it appears to be shrouded in mist and cloud, but while it was realised that it must be among the highest in the

world no details could be obtained until a few years ago. Then in 1947 photographs were taken from the air by Miss Ruth Robertson, a news photographer and a former war correspondent, at great risk to her machine and herself. Her aeroplane had to descend into the deep canyon below the Fall in order to secure a good picture, and there was very little room left for it to turn and escape from the narrow gorge by the only route available.

So impressed was Miss Robertson by this wonderful Fall that she determined to lead an expedition to visit its base and to make accurate measurements of its height. The journey that followed was one of dangers and hardship. There were five explorers in the party, including Mr. Lowrey, of the Socony-Vacuum Oil Company of Venezuela, and with them were a Latvian who acted as guide and ten Indians. Part of the journey was made in dug-out

canoes that were leaky and overloaded, and only dehydrated foods could be carried because of lack of space. Tropical rains and insects helped further to make life very uncomfortable, but the party struggled through in spite of these and other difficulties until at last they reached the foot of the fall. The first sight of this, visible to Miss (Continued on page 197)



The Victoria Fall, where the water of the Zambesi River plunges into a deep gorge. It was discovered by Dr. Livingstone.



On the Road

By J. Dewar McLintock

LET me start by offering my congratulations to Stirling Moss, J. M. Hawthorn and G. Murray Frame on winning the Dewar Challenge Trophy, for Sunbeam-Talbots. The award is made for the most outstanding engineering and technical achievement each year, and in this case it was for the outstanding performance of this make of car in the 1952 International Alpine Rally. Moss and Hawthorn proved that Grand Prix racers can be versatile types, I think you will agree. The trophy is put up by the R.A.C. for big efforts accomplished under the Club's competition rules.

In the recent Monte Carlo Rally, British cars again took the honours, with 1st, 2nd, 5th and 6th places in the first six. The outright winner was Maurice Gatsonides in a Ford Zephyr Six, Ian Appleyard being runner-up, in one of the lovely Jaguar saloons made by his wife's father—lucky man. Another "Jag" was fifth and that man Moss again was sixth in the Sunbeam-Talbot.

I think great credit must go to the Ford Motor Co. Ltd. for the way in which they quietly go about making drive-to-work cars that reveal a Mr. Hyde aspect of their personality immediately they get near a tough competition of any kind! Ford products top the bill in trials and rallies.

If they ever decided to go in for road racing, some socks would perhaps have to be pulled up, but I think they are content to make motor cars for the primary purpose of transport and leave it to the enthusiasts to do the rest.

The other great New Year news items in the private motoring world, of course, were the removal of the covenant on new cars, and the re-introduction of high-octane petrol.

Above is a scene during the Monte Carlo Rally, showing Maurice Gatsonides and Peter Worledge in their winning Ford Zephyr during the regularity test over the formidable Col de Braus route on the final day. Over this difficult circuit, competitors were required to maintain an average speed of 47 k.p.h., or approximately 29.2 m.p.h., in each of its four sections, one of which includes the ascent of the Col de Braus itself.

What about these new fuels? I can assure you there is nothing phoney about them. They are unquestionably far better than Pool, as many of you with motor bikes—and some with cars—have by now found out. What does high-octane mean? Well, octane rating is really very simple to explain. It is the value of the fuel in terms of its resistance to "pinking"

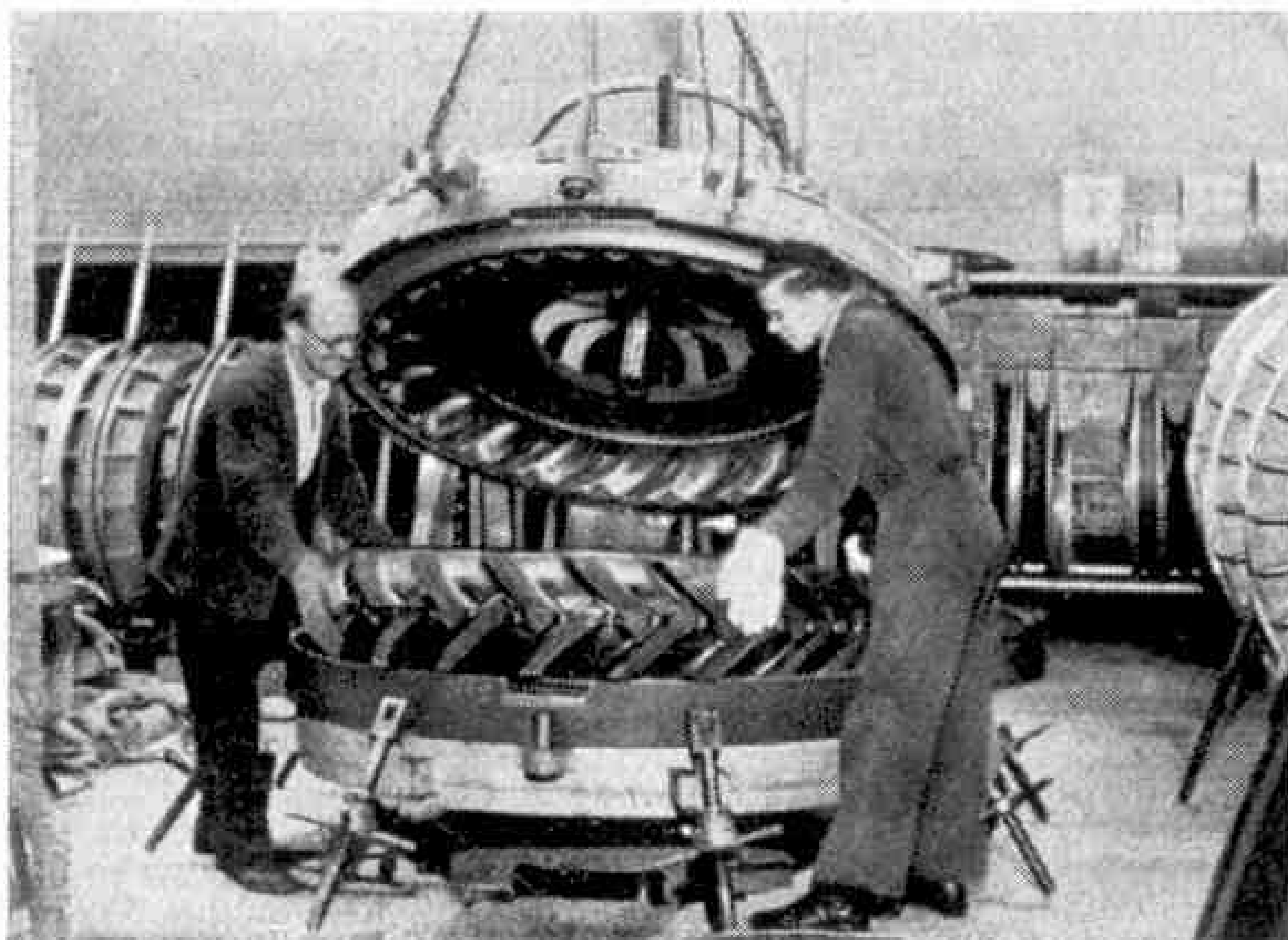
in a standard form of engine used by the "back-room boys."

In some car engines, the piston compresses the gas more than in others. These are high-compression engines, usually in sports cars—although the Ford Zephyr is an example of a non-sporting high compression engine. Such engines pink very easily, and high-octane fuel is of the greatest benefit to them. On the other hand, even a low-compression engine—probably of the side-valve type—will

benefit, because it can be given a more advanced ignition timing without pinking. What causes pinking? The queer metallic noise is caused by the air-petrol mixture exploding instead of burning quickly.

An accompanying illustration shows a giant tyre being turned out of a retreading mould. This picture was taken for me when I visited the Blue Peter retread works of Auto Tyre Services Ltd. at Basingstoke a little while ago. These people do the thing right from scratch, even mixing up their own rubber—for tyre rubber has to be compounded with other ingredients if it is to "stand the racket." The raw rubber arrives in vast gluey hunks. These are cut into smaller sections and made into sheets between great rollers, while the compounding ingredients are added. The sheets are extruded into long reels of rubber strip, so shaped that they will fit on to the worn-out tyres that have been cleaned and roughened. After a strip has been put round a tyre, then cut and stuck down, the tyre is put in the mould to be cured by means of high-pressure steam. The mould contains a die that makes the bold tread pattern. Retreads such as these have a remarkably long life and are utterly safe.

I had the good fortune to spend a day out in a new Morris-Commercial 30-cwt. lorry early in the year, and my companion was a senior proving engineer, who incidentally had at one time acted as racing mechanic to the illustrious Freddy Dixon, who made the early Riley cars famous for their wonderful performance.



Taking a giant retreaded tyre from its mould. Photograph by courtesy of Auto Tyre Services Ltd.



Traditional wood framing and steel or aluminium panelling is still used on many luxury coaches, and production is speeded by the use of power tools such as the Wolf drills seen in action here.

We had great fun, especially when we visited the proving ground of the Motor Industry Research Association near Nuneaton. Some of you may have heard of that place—even seen it. A good many of the prominent car and commercial-vehicle makers use it to carry out prolonged

tests of specimen or prototype models. There are fast straights, Belgian pave sections, a corrugated road section, water splashes, jumps, a rough cross-country road, and a banked high-speed track that is still under construction.

When we rode on the pave, my teeth fairly chattered and I felt rather like a pea on a drum. Any vehicle covering many miles on that stuff is certainly taking a bashing. Then we went on the corrugations and my jitters were equally violent, but more regular! On the rough country track the lorry, fully laden with metal blocks, was as sure as a trials special, and comfortable, with plenty of power.

BOOKS TO READ

Here we review books of interest and of use to readers of the M.M. With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"ALL ABOUT SHIPS AND SHIPPING"

Edited by EDWIN P. HARNACK
(Faber 25/- net)

This handbook, of pocket size as far as length and breadth are concerned, but made distinctly portly by the inclusion of over 700 pages, is now in its ninth edition, and has been fully revised and brought up-to-date. There are new chapters on the development of the sailing ship and tanker, while the section dealing with the fleets of the principal shipping companies has been extended and includes many new illustrations.

Two things are noteworthy about the handbook. One is the wonderful amount of information on ships and shipping that it gives in concise and easily readable form, and the other is its high standard of accuracy. Nobody deeply interested in the sea and the ships that sail it can afford to be without it, for it supplies the answers to thousands of questions, and provides hundreds of illustrations, many of them in colour, that are of the greatest value to sailors and ship lovers alike.

"WORKSHOP PRACTICE"

By A. E. PEATFIELD, A.M.I.Mech.E.
(English Universities Press 6/-)

This book, although complete in itself, is actually the final part of a three-volume work that as a whole constitutes an excellent practical introduction to Mechanical Engineering. The earlier works dealt with *Hand Tools* and *Engineering Components and Models*, and there are several references to them in this third volume. The present book is designed as an introduction to the methods and procedure practiced in engineering workshops, and the subjects dealt with include the reading of mechanical drawings; pattern making; moulding and foundry work; blacksmith's work, forging, etc.; the various branches of machine-shop work such as drilling, lathe-work, planing, shaping, etc.; welding; fitting, assembly, erection and installation of machinery, etc. The final chapter explains the uses of the different items and drawing instruments that make up the equipment of the engineering draughtsman.

The book is illustrated with nearly 200 excellent line drawings which are themselves an education to the engineering student, and there is a good index.

"ABC OF MOTOR CYCLES"

By JOHN DUDLEY
(Ian Allan 2/-)

This addition to the familiar ABC series of booklets breaks new ground. It contains photographs and specification details of many makes of British motor cycles, autocycles and threewheelers, together with descriptive notes on each make. There is a comprehensive list of registration letters, and details of a "Spotting the number-plate" game.

"4,000 MILES ON THE FOOTPLATE"

By O. S. Nock, B.Sc.(Eng.)
(Ian Allan 17/6)

Travelling on the footplate of a steam locomotive is always a thrill for the amateur enthusiast, and indeed most M.M. readers would give a great deal to be able to enjoy such a run. As this is out of the question for most of us, the next best thing is to read of the experiences of one who has been there, not once but many times. The author is well known for his footplate activities and always manages to give a convincing word picture of any trip that he makes. Older readers may remember a series of footplate articles from his pen that appeared in the M.M. in pre-war days.

The title of the book speaks for itself, and there is a pleasing variety in the trips that make up the complete

story. In addition to important main line runs, some of them on B.R. Britannias, a special feature has been made of journeys on engines over routes that are not so much in the public eye. Mr. Nock's accounts of these cross-country and secondary routes, on some of the older engines still in service, make a welcome change from stories of top-link running on modern locomotives.

Apart from the narrative, there are many logs of different journeys and an excellent selection of illustrations, some of which show the individual engines on which the author rode, add to the attractions of the book.

MORE STORIES

Drake was my Captain by DOUGLAS BELL (Warne 7/-) is a fine yarn about a man who sailed the seas with Francis Drake, a story of battles at sea, of capture and escape, the rout of the Spanish Armada, and the seizure of treasure-ships. In recalling those thrilling events the old sailor creates a vivid picture of seafaring life in the days of Queen Elizabeth the First.

Quite different is *The School on North Barrule* by M. E. ALLAN (Museum Press 7/6), a jolly and exciting yarn of life at a co-educational school in the Isle of Man. It will appeal specially to readers who have been fortunate enough to visit this lovely island.

In *The Young Brevingtons* by IRENE BYERS (Parrish 8/6) we learn how the twins John and Nicola Brevington become involved in the formation of a youth club to provide a constructive outlet for the energies of the youth of the neighbourhood, and of the strange experiences and adventures that follow this step.

If you like stories of adventure at sea, especially in full-rigged sailing ships, you will revel in *The Queerfella* by Capt. Sir DAVID BONE, C.B.E. (Merchant Navy, Retd.). The Queerfella is a young seaman who while drunk joins the 1,200-ton windjammer *Bryn Gower* at Garston, Liverpool, one day in 1900. Gradually, by display of superior seamanship in emergency, he wins promotion to Third Mate and finally a chance to command. Adverse weather, the shifting of the cargo, and a cyclone in the Bay of Bengal are some of the difficult circumstances that test his competence to the utmost.

Each of these books has a coloured frontispiece.

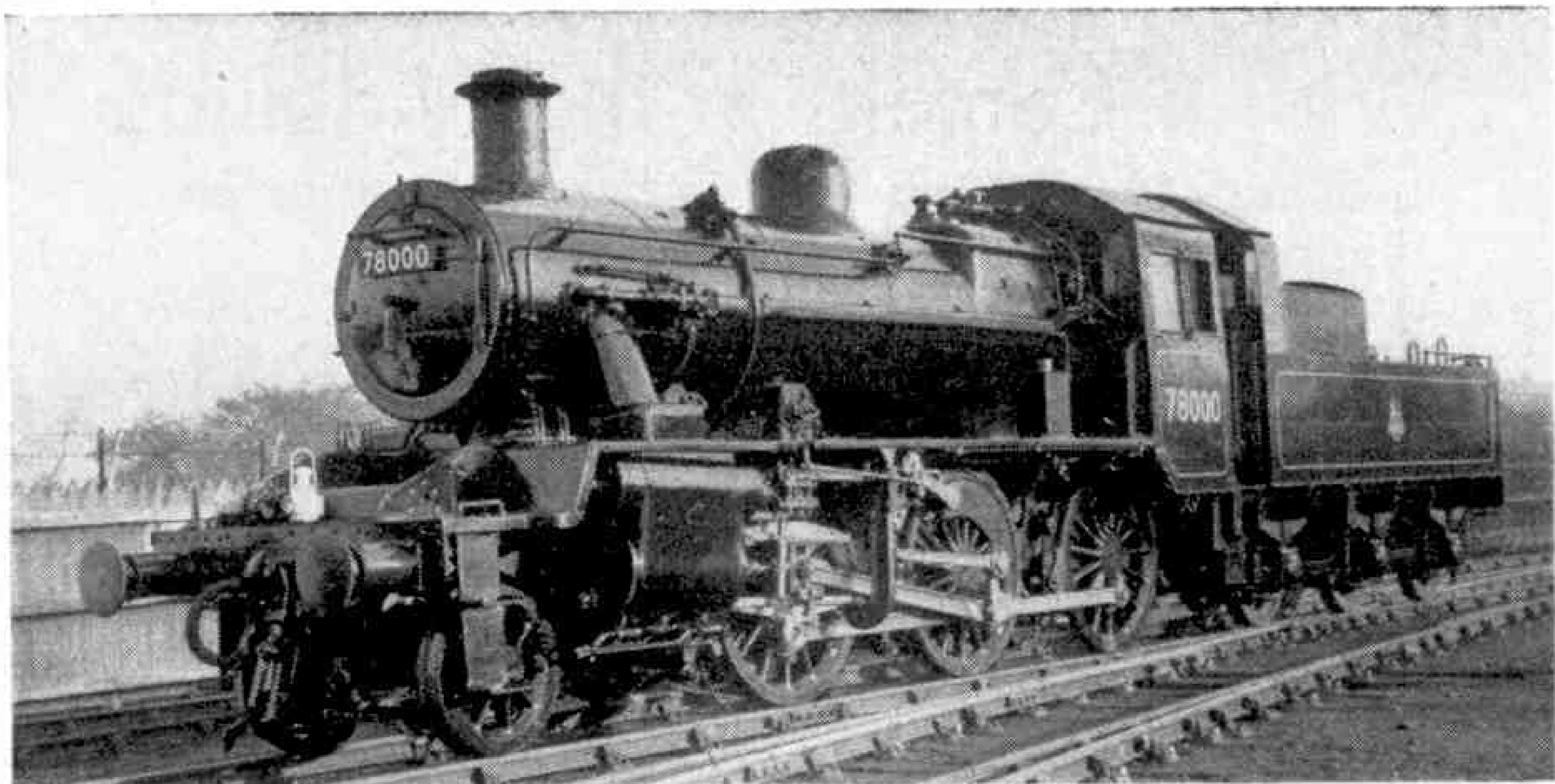
"MODEL MAKING AS A CAREER"

By T. W. HENDRICK
(Percival Marshall 5/-)

The increasing use of scale models in research, in industrial and other exhibitions, town planning projects, and as publicity material in large stores has drawn attention to the fact that the making of such models offers a very congenial career to the craftsman with an aptitude for it. It has also made many people realise that model-making as a leisure pastime can be very fascinating.

This excellent little book is therefore very timely. The author has had much experience in interviewing applicants for positions as craftsmen in an organisation specialising in producing scale models of all descriptions, from aircraft and machinery to ships and models of complete towns, and the advice he gives is thoroughly practical. After discussing the growing demand for scale models of various types, he describes the methods employed in designing and producing them, and the workshops and types of craftsmen involved. He then deals with the qualifications needed by those who wish to take up model-making as a career, and explains how to get in touch with commercial producers.

The book is illustrated with many fine half-tone photographs of scale models in production and of complete exhibits.



B.R. "Lightweight" 2-6-0 Locomotives

THERE are always sections of railway, usually branches and cross-country lines, where engineering restrictions make engines of light axle weight and generally moderate dimensions necessary. The track may not be suited to heavy loads, there may be underline bridges of limited capacity, or there may be tunnels where the dimensions are rather tight. In days gone by such routes were frequently the haunts of veteran engines which could spend their declining years on light duties. Although this practice had its picturesque side many of the engines so used were hardly ideal for the job, especially if they were of the express type with large driving wheels. Frequently, too, the accommodation for the crew was rather scanty and tender-first working in rough weather would be a miserable business for the men.

Following the example of the former L.M.S., which produced a lightweight 2-6-0 specially for such work late in 1946, British Railways have now produced a standard engine of similar type. The first of these engines, No. 78000, is shown in the picture on this page. The class, of 10 engines in all for the moment, built at Darlington, are for service on the Western Region. The design originated at Derby, but Swindon, Brighton and Doncaster Drawing Offices have been responsible for certain sections. It represents the smallest tender engine to be included

The illustration above shows No. 78000, the first of a series of lightweight 2-6-0s built by British Railways. The first 10 engines are for service on the Western Region. British Railways Official photograph.

in the range of 12 B.R. standard locomotive types.

Although small, the new engine incorporates features of modern locomotive practice that have been successful on the larger standard designs. As with those, the main idea has been to incorporate characteristics making for quicker and easier preparation and disposal of the engine when on the shed. Thus a rocking grate has been fitted, a self-emptying ashpan and a self-cleaning smoke-box. Another point—grease lubrication has been extensively applied, the nipples for the purpose being grouped into batteries.

The boiler has a tapered barrel and a Belpaire fire-box, and its principal dimensions are identical with those of the London Midland 2-6-0s previously referred to. Control of the regulator valve in the dome is effected by means of a pull-out type of regulator handle in the cab, the connection being made externally by the rod that passes along outside the fire-box casing in our illustration. The cab layout follows the arrangement approved before the larger B.R. standard locomotives were built.

The tender is designed for easy working and maintenance equally as much as the engine. It has roller bearing axleboxes. The sides of the coal bunker are set in from the sides of the tank and the tank top, which is kept low, carries nothing but the necessary fittings in the rear.

With a Camera in the Midlands

Lineside Adventures of a Railway Photographer

By H. Gordon Tidey

I RETURNED from my 1952 railway photographic tour with many good pictures and a resolution. This last was never to travel again on such a trip with less than three pairs of trousers, and a liberal supply of safety pins. Healing balms for nettle stings also seem necessary, if such things exist; dock leaves are not reliable enough for me.

But let me tell the story in order. With conditions as at present it becomes more and more of a problem to decide where to go to get as much variety as possible into a week specially given to railway photography. Therefore after much consideration I decided to repeat a tour which I did some 25 years ago, embracing Sharnbrook bank, on what was the Midland, and Rugby with its interesting station and set of water troughs at Newbold. Next came Charwelton, late Great Central, also with troughs, and finally the troughs between Denham and Ruislip on the former Great Western and Great Central Joint Line.

Through travelling by car I came across many spots where one could halt, such as Aynho, where the troughs are actually situated under the road on the old Great Western Birmingham line. At another very favourable spot I obtained a very nice shot of the *South Yorkshireman*. This was near Wendover, where the line runs beside the road for several miles.

But to start at the beginning; packing my usual impedimenta in the back of the car I started away from Barnet, taking the road through St. Albans, Luton and Bedford. My intention was to put up at Higham Ferrers just north of Rushden, but arriving soon after midday at the branch road to Sharnbrook I thought it well to take advantage of the bright afternoon. So, parking the car in a quiet

lane, I made my way down on to the line at a spot about a mile north of Sharnbrook Station. There I found a signal box and immediately proceeded to make friends with the signaller, who was invaluable in giving me information as to such important matters as additional trains, trains running late and so on.

One peculiarity here is the difference in level of the passenger and goods lines; the latter, as elsewhere on the old Midland, run in a separate cutting many feet below the passenger lines. This of course involved



An L.M.R. up Manchester express near Sharnbrook. The engine is No. 45655 Keith, of the Jubilee 4-6-0 class.

considerable acrobatics in climbing up and down rather precipitous banks with a heavy camera case, often against time.

A few years ago one would have seen little else but the Beyer-Garratts working the goods trains, but these are now almost entirely in the hands of the Class 8 2-8-0s and during the whole of the time spent at this spot I only saw one of the former. The passenger trains are worked principally by the Jubilees, with an occasional Class 5 4-6-0, but I did note two Compounds in action, one hauling an up Manchester express of quite weighty proportions and apparently with small effort.

Having obtained some eight shots, owing to plenty of sunshine, I made my way back to the car and set off for Higham Ferrers. As I was equipped with

two dozen loaded slides, I had ample plates in hand for the next day's activities. So I had no need to repeat my plate changing performances as carried out in the cellar at Newton Abbott in the previous year, as described in the *M.M.* for May 1952.

The next morning was bright so I returned to the same spot at Sharnbrook and obtained shots of some eight or so other trains. Owing to the direction of the light in the morning I had, perforce, to confine my activities to up trains. With a short interval for lunch I continued here until late afternoon, when I took the road for Rugby (Midland). Although this is a quite important junction, with a large exchange goods traffic and a quite extensive engine shed, the station itself has actually only one island platform, of course with bays at each end. This has to accommodate to the North and West the lines to Birmingham, Warwick, and of course the main line to Crewe and the North. To the South runs the main line to London, with its branch via Northampton. All this results in plenty of interest. Time was when the branch trains were all worked by Midland Class 2 4-4-0 and various small L.N.W.R. tender engines, but these are now almost entirely superseded by 2-6-2 or 2-6-4 tank engines on locals, and by Jubilees and smaller 2-6-0s on the Birmingham semi-fast trains.

Rugby station itself is a fair distance from the town and the latter is not too plentifully supplied with hotels, so I sought accommodation as near the station as I could. As by this time I was needing



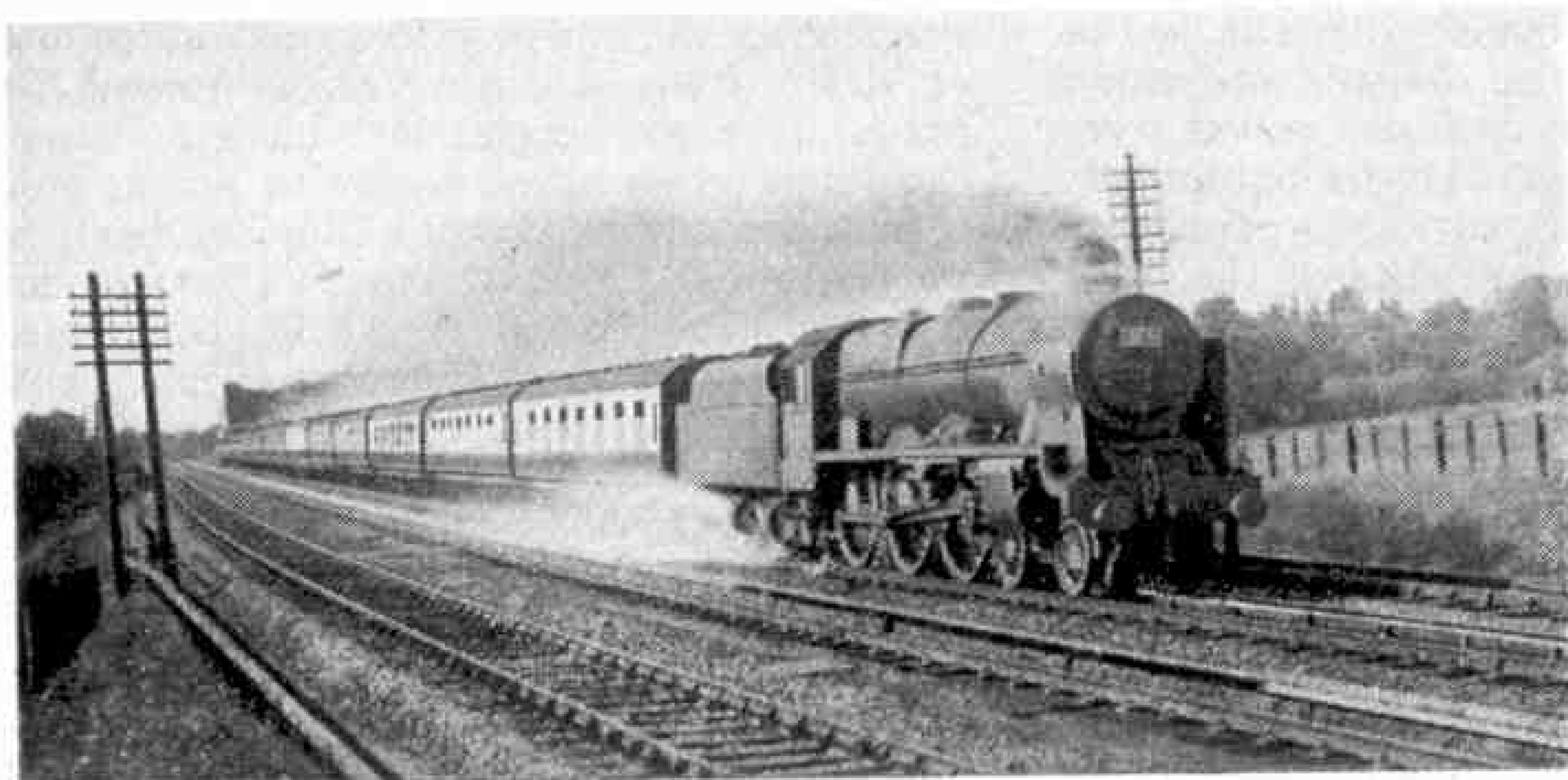
A heavy train of empties plodding northward near Sharnbrook behind No. 47995 of the 2-6-0; 0-6-2 Beyer-Garratt class.

to change my plates I considered myself lucky in being allotted a bedroom that was really satisfactory for the purpose. It had window curtains that excluded most of the light, no fanlight over the door, which for once fitted fairly well, no main road near, and twin beds with a nicely-shaded cavity between!

So I was able to operate in comparative comfort, very different to my capers in the coal cellar in 1951. There is something very fascinating in packing these exposed plates in the boxes for eventual development on returning home. Mentally one wonders. Have any of these got two exposures on the same plate? Did I

allow this one to get too close before exposing or conversely did I fire too early? Will someone turn on that light in the passage and fog the whole lot? All these questions have to remain unanswered until one gets down to developing.

My chief reason for making Rugby a port of call was to visit the Newbold



The up Welshman picking up water at Newbold Troughs, near Rugby. The engine, No. 46101 Royal Scots Grey, seems to have lost its chimney!

troughs, which are situated some way north of the station, towards Brinklow. Although during a recent train journey I had spotted an overbridge that would give easy access to the line, I had considerable difficulty in finding it by road, as I was not armed with a detailed map of the town. The open fields that existed when I was last there are now covered by a veritable township of pre-fabs. So after cruising about for a considerable time on different roads, all of which invariably turned in a different direction just as I thought I was getting near the spot, I eventually did manage to find my bridge, but only by turning down a very unobtrusive lane which gave every indication of leading only to very extensive cement works.

Climbing through a fearsome fence reinforced with barbed wire, my foot slipped and I descended some way down the steep bank. Unfortunately the barbed wire refused to part with my trousers and a tearing rend advised me that I had left a fair-sized triangle of cloth behind by way of a souvenir. Fortunately I had a spare pair of trousers in my bag in the car, but as one cannot, in common decency, change one's trousers on a railway embankment I had to retrieve the missing piece and replace it as best I could with the aid of safety pins. During the delicate operation the camera case, unattended, rolled over and over to the bottom of the embankment, narrowly missing a ditch, fortunately without harming the contents of the case.

Here again one sees Class 8 2-8-0s on the majority of the goods and mineral trains, and during the whole of my stay I did not set eyes on one of the fast disappearing 0-6-0 Cauliflowers. As I stayed at Rugby until the Sunday afternoon I was able to take my choice photographically of the extensive service that runs on summer weekends. Many important trains were running in two or more portions, and I particularly noticed the complete absence of the double heading

once so prevalent. Evidently the Stanier engines do not need assistance! I was also surprised at the loads given to unrebuilt Jubilees, at times even up to 15 coaches.

I spent one day at Charwelton obtaining a few shots of Manchester and Sheffield expresses. Goods are worked now by the old G.C. 2-8-0 and rebuilt engines of class 01. Trains here are few. The troughs



One of the tough-looking W.D. 2-8-0 engines No. 90080 passing over the troughs at Denham with a down Western Region goods train.

are, I imagine, among the longest in the country and the tanks of locomotives appear to be filled up before the train has traversed much more than a third of the length.

On leaving Rugby I had a pleasant run to Banbury, where in addition to cakes one strikes the late G.W. and G.C. Joint Line. After one day here I left for Amersham, following the road that runs parallel to the railway for some miles and at quite frequent intervals is joined by roads at right angles, which cross over the line and so allow access to what often turn out to be useful points from a photographic point of view. There is not a lot of interest on this line, the trains being largely long-distance locals, now hauled by the ex-L.N.E.R. 2-6-4 tanks, but I did manage to get a nice one of the *South Yorkshireman* on its up journey.

Continuing leisurely on my way I arrived at Amersham about 6 p.m. and having taken advantage of such an exceptionally useful bedroom to unload all my slides before leaving Rugby, I had enough plates available to see me through. Not needing any

(Continued on page 222)

DINKY TOYS

More about recent additions



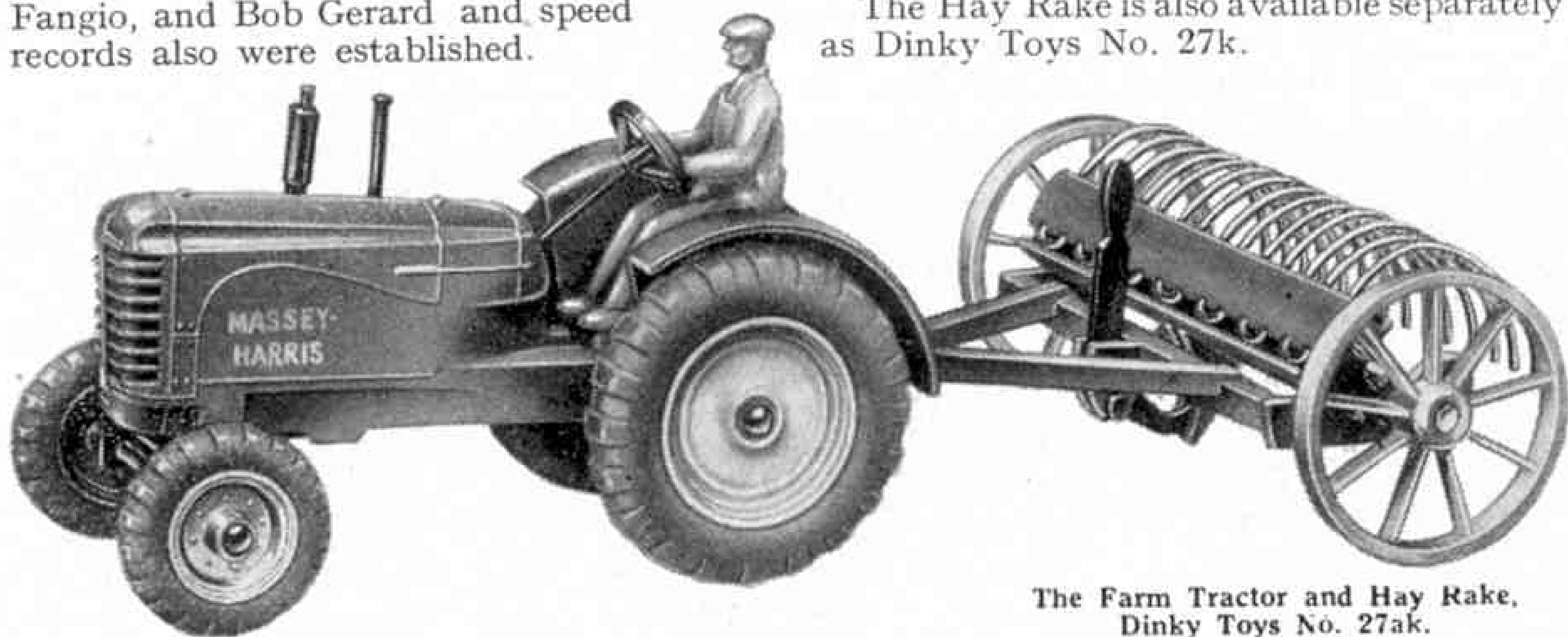
The Cooper-Bristol Racing Car, Dinky Toys No. 23g.

THE Dinky Toys announced last month are really bright and colourful. The first of them will be greeted with acclamation by every *M.M.* reader, and particularly by those who are interested in motoring, for it is a splendid miniature of a British racing car that has become famous in recent years. This is the Cooper-Bristol, one of the most promising of Great Britain's Formula II racing cars. It is the most recent of a fine series that began with the appearance in July 1946 of the Cooper No. 1, with a 500 c.c. single cylinder J.A.P. engine, which astonished critics and enthusiasts by its performance in the Prescott Park Hill Climb. As 500 c.c. racing developed the car established a great reputation in the hands of many brilliant drivers, among them John Cooper, Ken Wharton, Stirling Moss, Alan Brown, Fangio, and Bob Gerard and speed records also were established.

This fine car was followed by a 1,100 c.c. model, and then came the highly successful two litre Cooper-Bristol, the original of this fine Dinky Toy. This is a faithful reproduction, with the characteristic long bonnet and radiator grille, with two realistic exhaust pipes emerging from the side of the bonnet before being carried backward. The model is enamelled green, the colour of British racing cars, and a series of these cars on a Dinky Toys racing track, with their white-helmeted drivers, will make a very fine impression.

The second of these two fine recent Dinky Toys is a combination of a Farm Tractor and a Hay Rake. The Farm Tractor is the well known Massey-Harris production, already a universal favourite. The Hay Rake is a very fine example of a farming implement that can be hauled by it. It has large wheels and substantial tines, which can be lowered near the ground in order to rake up the hay, or raised to leave a swathe behind them, or for movement along the roads, by simply moving a lever that is readily accessible. Nothing could be more realistic.

The Hay Rake is also available separately as Dinky Toys No. 27k.



The Farm Tractor and Hay Rake, Dinky Toys No. 27ak.

Air News

By John W. R. Taylor

Coronation Review

The Air Ministry has announced that the Coronation Review of the Royal Air Force by Her Majesty the Queen on 15th July will take place at the famous R.A.F. fighter station at Odiham, Hampshire. Among squadrons which have been based at Odiham is No. 54, whose Vampires made the first crossing by jet aircraft of the Atlantic in 1948.

Students Design Baby Jet

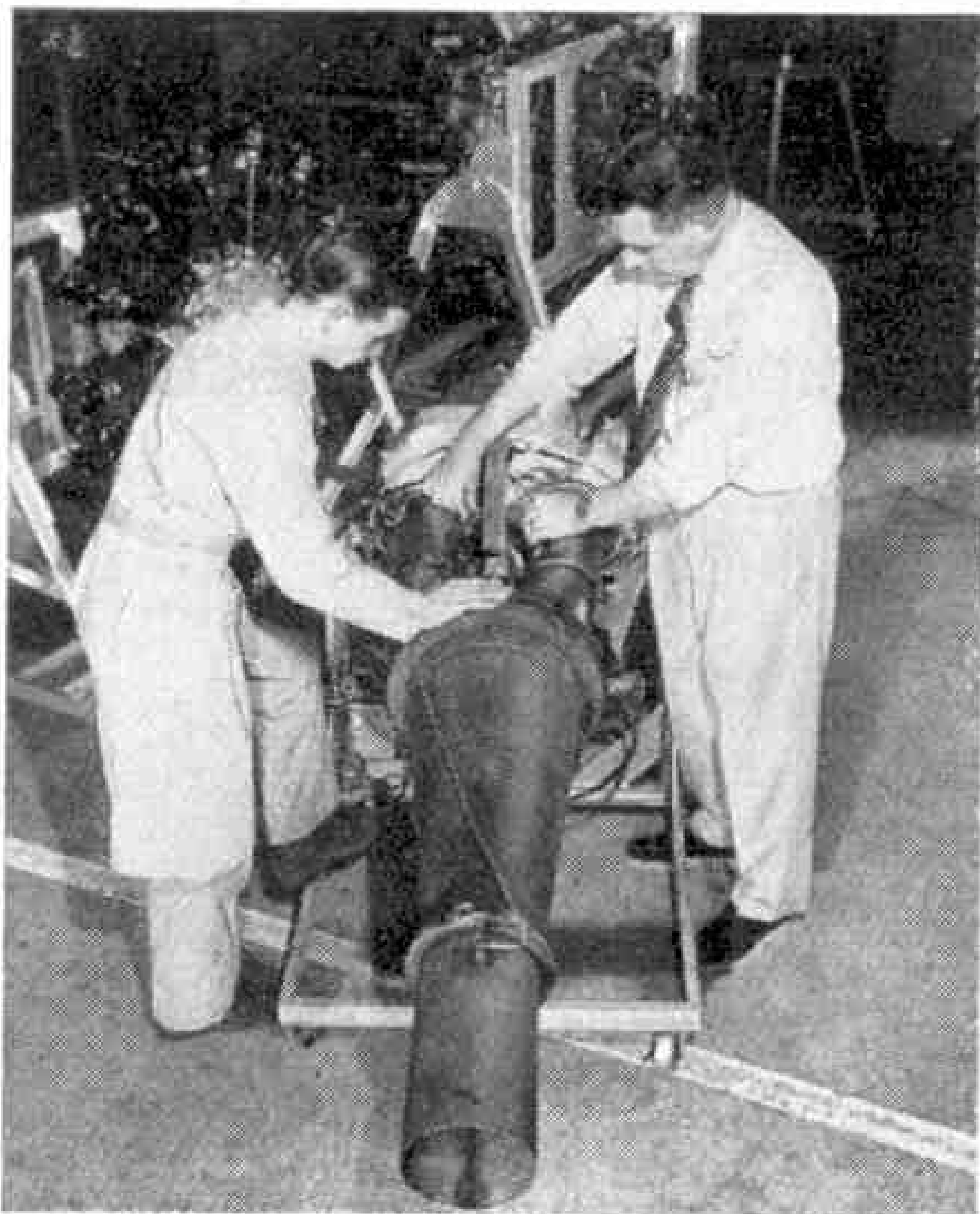
Students of the Northrop company's Aeronautical Institute at Hawthorne, California, are putting the finishing touches to a miniature turbojet engine named the Centriflow, which may well introduce jet-propulsion into the American light 'plane industry. The new engine weighs only 172 lb., but develops about 340 lb. thrust—enough to power a small 'plane at speeds in the 300 m.p.h. range, depending on its structural strength. Present plans are to fit the prototype engine into a Ryan Navion as soon as ground tests have been completed.

There are about 1,000 students at the Northrop Institute, which offers a dual curriculum—a two-year course in aeronautical engineering and a 12-month aircraft and engine mechanics course. Centriflow represents more than two years of research and development by students in the jet-engine field. Two previous models were built by advanced engineering students to gain practical experience in power plant design. The latest engine, illustrated here, shows considerable design improvement, including a unique four-burner arrangement which, by using four combustion chambers parallel to the engine axis, produces a powerful, compact, lightweight unit.

U.S. Navy Adopts British Flight Refuelling

In contrast with the U.S. Air Force, who use the Boeing "flying boom" type of flight refuelling, the U.S. Navy have chosen the British "probe and drogue" method developed by Sir Alan Cobham's Flight Refuelling company; and numbers of the Navy's biggest carrier-based aircraft, North American AJ-1 Savage bombers, are being modified into tankers. Externally, they look little different to standard AJ-1 atom-bombers or longer-nosed AJ-2P Savage photo-reconnaissance aircraft. They are ideal aircraft for the job, as they have a high enough speed to accompany fighter aircraft on patrol; and, despite their size, these 26-ton aircraft can be handled by a crew of only three.

Flight refuelling works on the principle that an aircraft can fly with a greater load than that with which it can take off. Thus U.S. Navy fighters will be able in future to take off with heavier armament



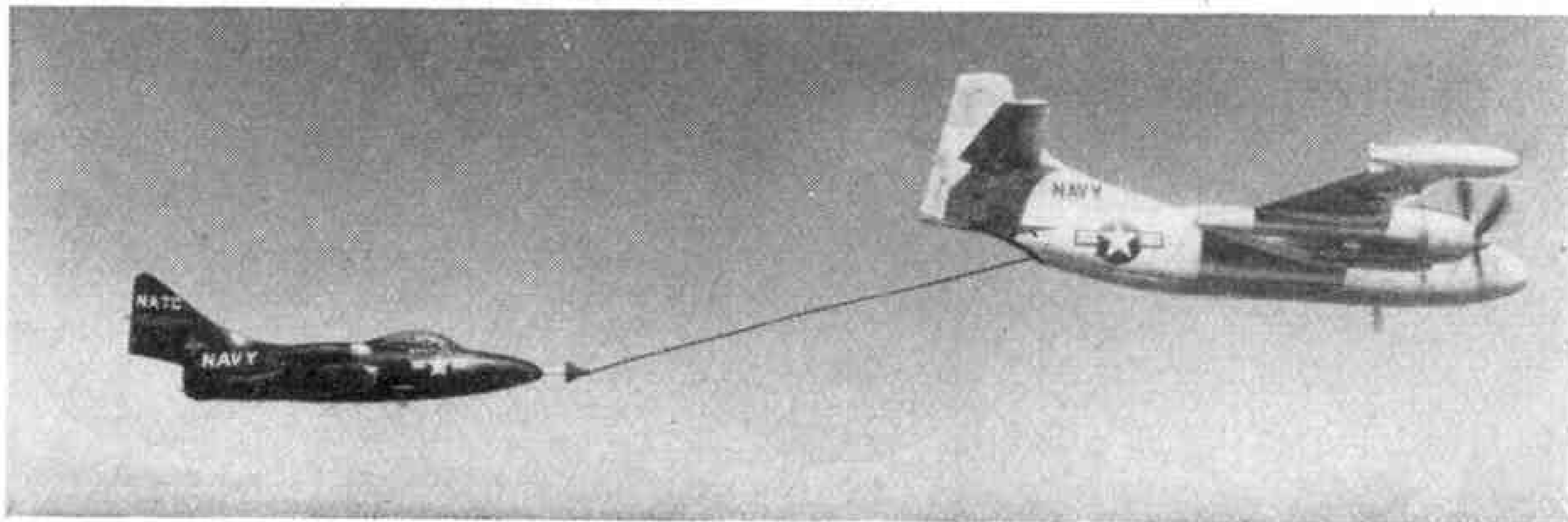
The Centriflow miniature turbojet engine built by students of the Northrop company's Aeronautical Institute. Photography by courtesy of Northrop Aircraft, Inc., U.S.A.

and load up with fuel in the air. They will also be able to fly far beyond their usual radius of action to attack enemy targets, and maintain continuous defensive patrol for long periods by refuelling in mid-air, instead of making repeated, difficult landings aboard ship.

The Boyd Trophy

The Boyd Trophy, presented annually for the most outstanding feat of aviation in the Royal Navy, has been awarded for 1952 jointly to Nos. 802 and 825 squadrons for their achievements in Korea. The Trophy, which takes the form of a silver model of the famous wartime Swordfish torpedo-bomber, was given by The Fairey Aviation Company to commemorate the work of Admiral Sir Denis Boyd. It will be held by H.M.S. *Ocean*, the light fleet carrier from which the Sea Furies and Fireflies of Nos. 802 and 825 squadrons flew a record total of 123 sorties during one day's operation in the war zone.

A division of 802 Squadron also accounted for the first MIG-15 shot down by the Royal Navy; while 825 established an average deck landing accident



Panther jet fighter being refuelled from a North American Savage bomber converted into a tanker aircraft.



Canadair Four transport of the Royal Canadian Air Force. Canadian National Defence photograph.

rate of only one in 496 landings, including one accident-free sequence of 1,613 landings.

Royal Canadian Air Force in Britain

In addition to the Royal Canadian Air Force's wing of three squadrons of Sabre jet fighters, based at North Luffenham in Rutlandshire, several other types of R.C.A.F. aircraft are seen regularly in British skies nowadays. They include three Bristol Freighters, used to carry Sabre spares between No. 30 Air Material Base at Langar, Notts., North Luffenham, and Gros Tenquin in France, and handsomely-painted Canadair Four transports of the type illustrated above. In addition, Lancaster 10-MR patrol bombers sometimes put in an appearance during air-sea warfare exercises, proving further Canada's determination to play her part to the full in the North Atlantic Treaty defence Organisation.

Flying Classroom

Australian education history was made recently when 24 children from the Curlwaa Public School, Mildura, Victoria, received their first geography and town-planning lesson from the air.

The school chartered an Australian National Airways' Dakota for the lesson; and for 30 minutes children and teachers were flown over Mildura and nearby areas on each side of the Murray River. They studied the planning and layout of their home town, the geographical features of outlying districts, and the course and irrigation system of the Murray.

Man Versus Locust

One of the most significant air battles of the present day is being waged in Kenya, where Auster light 'planes of the United Nations Food and Agricultural Organisation are fighting locusts with D.N.O.C. and D.D.T. Combat results are being studied keenly in every territory where the locust is high on the list of the public enemies.

The pilots have to go into action around dawn, when the locusts take off in a swarm some two or three miles long, a mile wide and several inches thick. For best results, they have to fly in among the locusts, and wire meshes had to be fitted to the air intakes of the aircraft to keep the locusts out. The spray has no immediate effect, but over a period from one hour to two days later, the swarm is grounded for good. If a stronger spray were used, its vapour would ground the pilot too!

British-built Austers were chosen for the work because they can operate from small fields in any kind of terrain, and because they can cruise slowly in pace with the "enemy." They are, in fact, proving once again that they can do this type of work as well as any helicopter, at very much lower cost.

Stratojets on the Way

If all goes according to plan, this month should see the arrival in Britain of the first wing of 600 m.p.h., swept-wing Boeing B-47B Stratojet atom-bombers.

The U.S. Air Force has, at present, two fully-operational wings of these fine aircraft, one of which is shown below in flight. They will add immensely to the striking power of N.A.T.O. air forces in Western Europe, because their normal 3,000-mile range with up to ten tons of bombs can be extended almost indefinitely by in-flight refuelling, using the Boeing "flying boom" method.

The Stratojet carries a crew of three, and is armed with two radar-aimed, remote-controlled, .50 in. tail-guns. The underwing pods, containing its six 5,800 lb. thrust General Electric J-47 turbojets, contrast sharply with the clean, buried engine installations of the British Valiant and Vulcan bombers; but they permit use of a very thin wing section and facilitate maintenance and engine replacement.

Cream Cheese Specials

Every Sunday morning Bristol Freighters of Silver City Airways take off from Le Touquet for Lympe with a load of Gervais cream cheeses. Lorries take over the cargo on arrival, and within 48 hrs. of leaving the French factory the cheese is distributed to points as far afield as Scotland and the North of England.



A striking plan view of the Boeing B-47B. Photograph by courtesy of the Boeing Airplane Company, U.S.A.

A United States Hot Spot

The Underground Fires of the Hocking Valley

By Francis J. Knight

HOCKING Valley, in Ohio, besides being the hottest spot in the United States, is one of the weirdest sights in the world.

In some parts of this fantastic area it is possible to sink a saucepan of water into the ground and watch it boil, and potatoes can be baked by plunging them into the ground! Hot streams run through some of the few woods remaining in the area, and flowers bloom all the year round.

The reason for these strange things is that the whole twelve square miles of Hocking Valley is riddled by underground coal fires, which have been burning for more than 60 years, defying even the most modern fire-fighting technique. It is estimated indeed, that the Hocking Valley underground fire, the most disastrous in United States history, has eaten up £25,000,000 worth of good coal.

The shocking part of this tragedy of

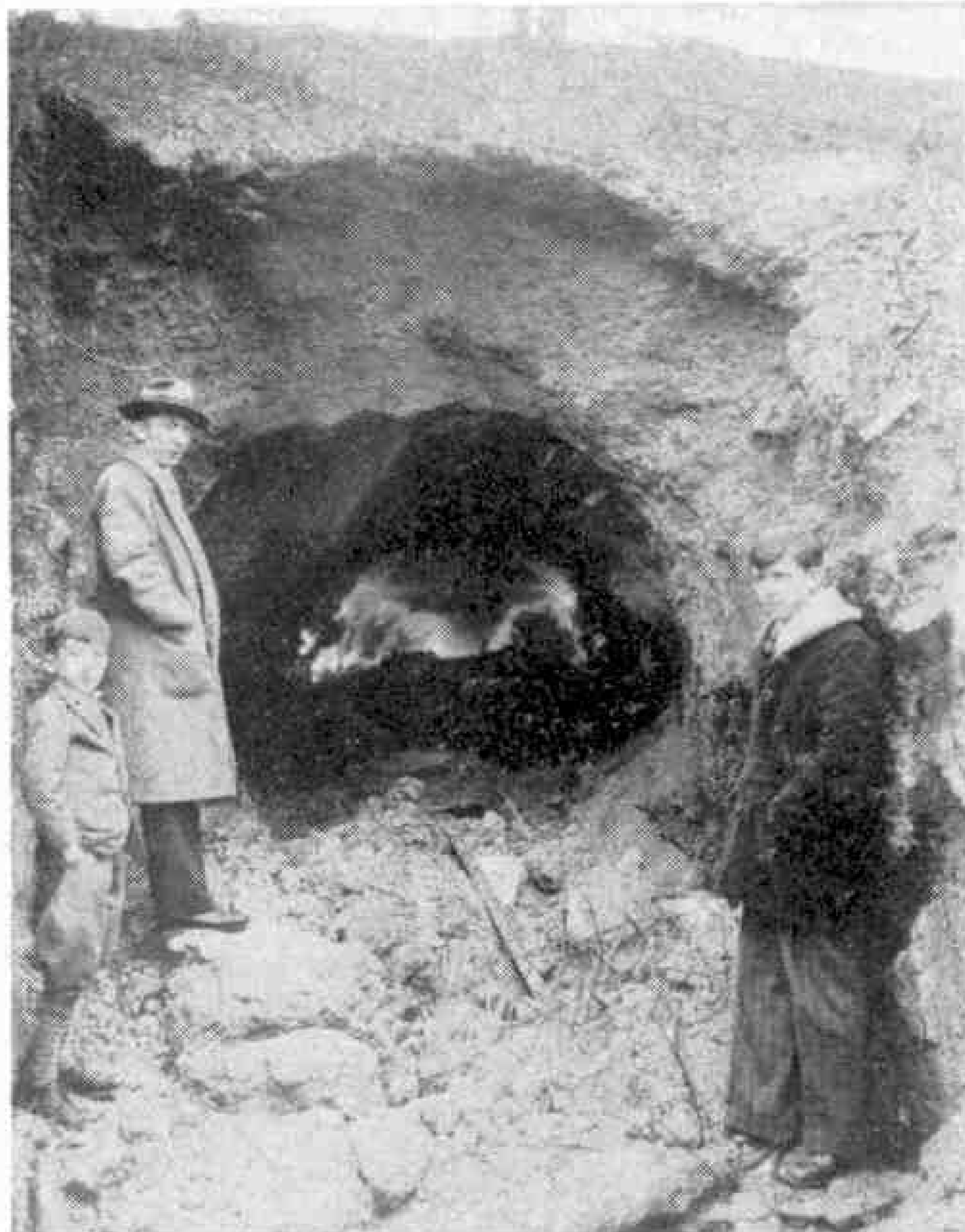
waste is that the fires were started deliberately. This act of wanton destruction occurred back in 1884 during a long and bitter strike feud. A crowd of angry and desperate miners seized some wagons full of coal, poured oil on them, set them alight and hurled them down the mine shaft to fall blazing on the floor below. Soon the whole mine workings were one huge blazing inferno.

Through the years various efforts have been made to quell, or at any rate to check the underground blaze, and the area has attracted mining and fire experts as well as sightseers from all over the world. Engineers first tried to contain the fire by sinking thick concrete retaining walls, but these cracked and collapsed under the intense heat. Next a stream was diverted into the Hocking Valley pit, but its only effect was to raise clouds of steam.

Then, in 1937, the U.S. Government made a grant of 360,000 dollars to finance a once-for-all effort to subdue the fires. Fire-fighting experts decided to sink three huge non-inflammable barricades and to bore more than a mile of tunnels to contain the fires. But before one barrier was completed, the whole project was called off and the task declared to be impossible. The United States Government has abandoned its active fire-fighting efforts in the area, and instead has sponsored a big re-forestation scheme. Where the fire is thought to have burned itself out, and earth temperature has returned to normal, thousands of new trees are hopefully being planted.

When mining began in the area it was reckoned that the Hocking Valley area contained about 84 million American tons of coal. So far some 50 million tons have been extracted in one way or another. Opencast mining of the outcrop coal is now going on wherever it can be done effectively and safely. Unfortunately, several violent new fires have broken out lately and opencast mining has had to be abandoned in many places.

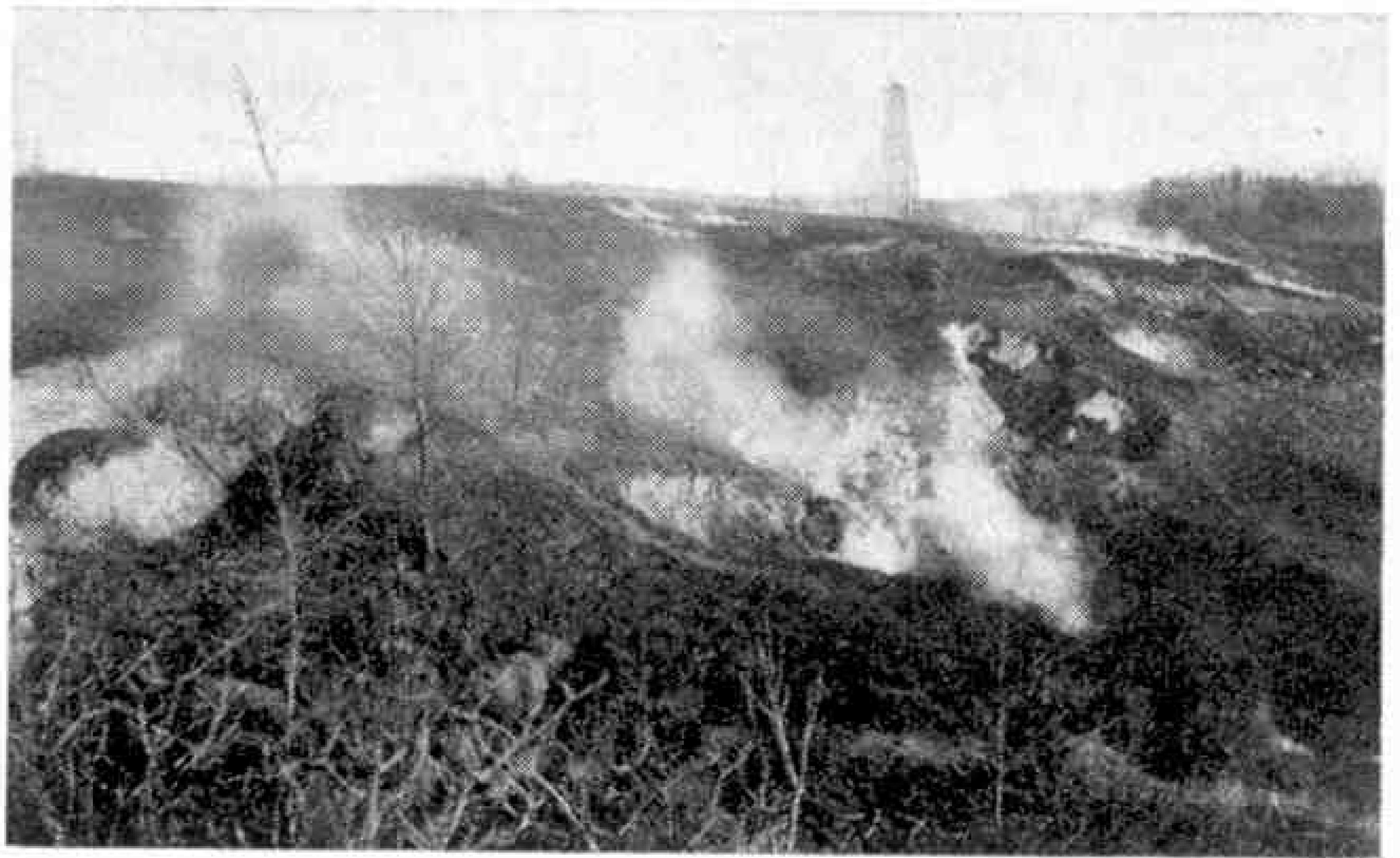
One unexpected result of the fires was that in prohibition days



Here is the entrance to a small mine at New Straitsville in Hocking Valley, Ohio, that had to be abandoned hastily when underground fire broke through into the shaft.

Hocking Valley liquor enjoyed a wide reputation. The abandoned mines made excellent caches for illegal stills, and unemployed miners are reckoned to have produced over a million dollars worth of bootleg whisky, which sold at from six to twelve dollars a gallon. In one raid alone, U.S. Revenue men found and destroyed more than 250 illicit stills in the old mine workings.

Today people living on the verge of the fire area have got used to their houses being overheated, winter and summer. Some of the nearby roads have sunk as much as five feet and miniature volcanoes are liable to erupt overnight. But the



A burning hillside in Hocking Valley. The illustrations to this article are reproduced by courtesy of the New York Times.

people of Hocking Valley are quite proud of their weird countryside. They even say they do not notice the acrid sulphureous smell that hangs over everything in this abandoned and desolate area.

The World's Highest Waterfall—

(Continued from page 185)

Robertson by the light of the full moon, was full of compensation for the hardships she had undergone.

Food supplies limited the stay at the Fall of the explorers to three days, during which photographs in colour and other records were taken. The survey made by Mr. Lowrey revealed that the Fall is by far the highest in the world, 19 times as high as Niagara, nearly seven times as high as the Victoria Falls and more than three times the height of the Eiffel Tower. The total height of over 3,212 ft. is made up of two falls, and the lower one of these, a single unbroken leap of 2,648 ft., is nearly 100 ft. higher than the combined heights of the two falls that make up the upper Yosemite cataract.

A mighty fall indeed, undoubtedly the highest in the world, as far as we know at present. Its waters descend from the Devil's Mountain, and plunge downward over the surface of a gigantic cliff, but they do not run over the upper edge of this. The district is one of limestone, in which water may disappear underground in a channel dissolved by the stream, as it does in the Mendips and other limestone areas in Great Britain where caves abound. The result is that the water of the Angel Fall actually bursts out well below the upper edge of the cliff. If it had simply

flowed over the top the total height would have been some 200 or 300 ft. more.

Niagara is a fall of a different kind from that now holding the world record for height. It has what is known as a rock cap. The Niagara river flows over a bed of very hard limestone, underneath which is shale, a softer rock that is more readily eaten away by the water. The result is that the rock cap is steadily being undercut and deprived of its support, with the result that it breaks away itself at its edges. The falls at Niagara indeed are moving backward, towards Lake Erie, and there have been many notable changes even in the comparatively small time since they first became well-known.

The falls in the Yosemite Valley are of a different type. Here a deep valley has been scoured out by glaciers in the past, and the waters of the falls plunge into it from tributary valleys that end high up on its own sides. The Victoria Fall provides an example of a cataract formed by the plunging of a river into a deep crack or rent, probably due to earth movements.

Will a yet higher fall than the Angel ever be discovered? If so the remote depths of the South American continent may well provide it, for there high plateaux are to be found, similar to the one that gives rise to the Angel Fall, and exploration may bring another giant to light.

We are indebted to the P.D. Review for the details of the Angel Fall and its discovery given in this article.

Robin Hood's England

By Arthur Gaunt, F.R.G.S.

ALTHOUGH the most diligent research has failed to establish beyond doubt whether Robin Hood ever existed, few other figures have such a secure place in English folklore and legend. Stories of his exploits abound, his name crops up in various ways throughout the English countryside, and statues of him are to be seen here and there.

Nottingham has honoured him by setting up a figure showing him in characteristic attitude drawing his bow, and a series of plaques nearby depict alleged incidents in his life. These Midlands memorials owe their existence to the tradition that the Merry Outlaw and his followers frequented Sherwood Forest, near Nottingham, and legend further states that his marriage to Maid Marian took place at Edwinstowe Church, on the fringe of the Forest.

Two lines of opinion exist about the tales told about him. Some authorities declare that he was merely a folklore character, a mythological figure akin to fairies and hobgoblins, whom English people in the Middle Ages imagined to dwell in the thick forests that then clothed

as sometimes claimed? Against that idea is the fact that at the time Robin Hood is said to have lived, the title was held by Prince David of Scotland.

Yet a 14th-century ballad refers to an outlaw called Robin Hood, who entered service at the court of King Edward II at Nottingham and remained a royal servant for nearly a year.

The astonishing fact is that there exists a record of royal household expenses which contains several references to a "Robin Hode" in the Royal court during 1324. Further, old court rolls for the Manor of Wakefield mention a "Robertus Hood" in that locality in 1325, and it is certainly a striking coincidence that the outlaw leader is said to have died at Kirklees, only a few miles from Wakefield.

Some students of history have put him down as a 12th-century outlaw who raided the hunting demesnes of Richard I, and state that he was born in 1160 or thereabouts, at Loxley, Staffordshire. Sir Walter Scott helped to

immortalise him by introducing him into *Ivanhoe*, in which Richard I also appears, but the first known record of an English outlaw called Robin Hood occurs in *Piers the Plowman*, which dates from 1377.

Whatever the truth about all this, the stories of Robin Hood and his companions lend romance to our countryside. Over a



Robin Hood on an inn sign. This example is at Mytholmroyd, near Halifax, but many others can be found in different localities.



The gatehouse of Kirklees Nunnery, near Wakefield and Huddersfield, where Robin Hood is alleged to have died. His reputed grave is 650 yards away.

the land. On the other hand serious efforts have been made to prove that Robin Hood was a flesh-and-blood person. Old documents have been examined in search of evidence to support this belief, and some interesting discoveries have been made.

Was he really the Earl of Huntingdon,

dozen features of the landscape are named after them, and there is even a village bearing the outlaw's name—Robin Hood's Bay, on the Yorkshire Coast. It is said that when the hue and cry became too hot for him in his usual haunts, he retired to this out-of-the-way seaside place. A story tells us that during one of these visits he and Little John taught archery to the monks of Whitby Abbey, so that the monastery might be more effectively defended against pirates.

Boynton, another hamlet near the Yorkshire Coast, claims to have Little John's thigh bone, though his grave is pointed out at Hathersage, Derbyshire. Two upright stones in Hathersage churchyard are reputed to stand respectively at the head and foot of the grave, and it is true that in 1780 some bones of huge size were unearthed at the spot.

Derbyshire indeed has several mementoes of the outlaw company. A stone pillar on Abney Moor, near Hathersage, is known as Robin Hood's Cross. Like Dumb Steeple, a stone column near Brighouse, Yorkshire, it is said to have been a meeting place used by them. A fantastic formation of rocks at Birchover, a few miles from Matlock, also includes a pile of boulders known as Robin Hood's Stride. They get their name from a tradition that the distance separating two rocky pinnacles shows the length of the outlaw's stride—though as these are some 22 yards apart the belief seems a little far-fetched!



The last hours of the Bold Outlaw, as shown on a plaque outside Nottingham Castle.

realising who his opponent was, Robin expressed contrition, and it was as a result of this encounter that he entered the King's service for several months.

Sherwood Forest still has many fine trees, and perhaps the most famous are the Major Oak and Robin Hood's Larder, the latter with a hollow trunk in which he and his followers hid the venison they had illegally acquired in this royal chase. Incidentally the Major Oak is not so-called because it is the largest oak in Sherwood Forest. Its name is a perversion of that of Major O'Rooke, a local antiquarian who made a close study of the trees in this area.

A number of Robin Hood's Wells can be found in different counties. A canopied one stands beside the Great North Road seven miles north of Doncaster, and it is a reminder that the nearby Barnsdale Forest rivals Sherwood Forest for its links with the outlaws.

Hereabouts occurred the exploit in which Robin slew Guy of Gisburn and



Known as Dumb Steeple, this pillar near Brighouse, Yorkshire, is reputed to have been a meeting-place of Robin Hood and his Merry Men.

made the Bishop of Hereford "dance in his shoes." According to some accounts, it was at nearby Campsall, and not at Edwinstowe, that Robin married Maid Marian.

The well by the roadside had no canopy until about 150 years ago, when the present ornate cover was erected over it by the Earl of Carlisle. Another well named after the outlaw is near Beauvale Priory, Nottinghamshire.

The scene of another daring exploit was Conisborough Castle, near Doncaster, where Robin and his band rescued some prisoners who had been taken there after being captured by nobles disguised as outlaws. The ruins of this castle are now cared for as historic relics by the Office of Works.

There are a number of caves associated with the Robin Hood legends, too. One such cavern, hewn from the solid rock, is at Papplewick, Nottinghamshire, and the story is that he used it as a stable.

Over one hundred inns possess painted signs showing him or some member of his band. Little John is depicted outside an inn near Fishpool, Notts., and Robin Hood himself is portrayed on the sign of another hostelry near Mytholmroyd, Yorkshire, together with the invitation:

Ye bowmen and ye archers good,
Come in and drink with Robin Hood;
If Robin Hood is not at home,
Come take a glass with Little John.



This modern statue of Robin Hood is at Nottingham, the scene of some of his exploits.

The Kirklees estate, near Wakefield and Huddersfield, has the reputed grave of the leading outlaw, as already stated. Moreover, the building where he is said to have ended his days still stands. It is the gatehouse of Kirklees Nunnery, and legend relates that from his deathbed he shot an arrow through the open window, instructing that he was to be buried where it fell. It must have been a great feat for a man aged 87, as he is supposed to have been, for the grave is 650 yards away.

The spot is now surrounded by high iron railings, inside which is a stone inscribed:

Here underneath this little stone

Lies Robert, Earl of Huntingdon.

No archer was as he so good,

And people called him Robin Hood.

Such outlaws as he and his men

Will England never see again.

The stone is not the original one, however, the first having been ruined by navvies building a nearby railway a century ago. They regarded chippings from it as a reliable cure for toothache!

There are records of the death of an Earl of Huntingdon at Kirklees in the Middle Ages, but was he Robin Hood? Nobody knows, yet the mystery increases the romance of places and objects alleged to be connected with the Merry Outlaws of Sherwood.

Electric Shocks to Guide Fish

When a dam is built across a river the path of salmon and other fish proceeding upstream is blocked. This difficulty is met by providing fish ladders or passes. These are special water courses, often ascending in steps, that carry the fish around the dam. To make sure that the fish go the right way, and do not swim into the tailraces of the power stations below the dams built on certain Scottish

rivers by the North of Scotland Hydro-Electric Board, screens made up of aluminium tubes at short distances apart have been placed in the water below these and pulsating current is applied to them.

Salmon become uncomfortable at distances of several feet from the screens, and turn away from them. They suffer no ill effects from the electrical disturbances to which they are subjected.

Photography In the Woods

By E. E. Steele

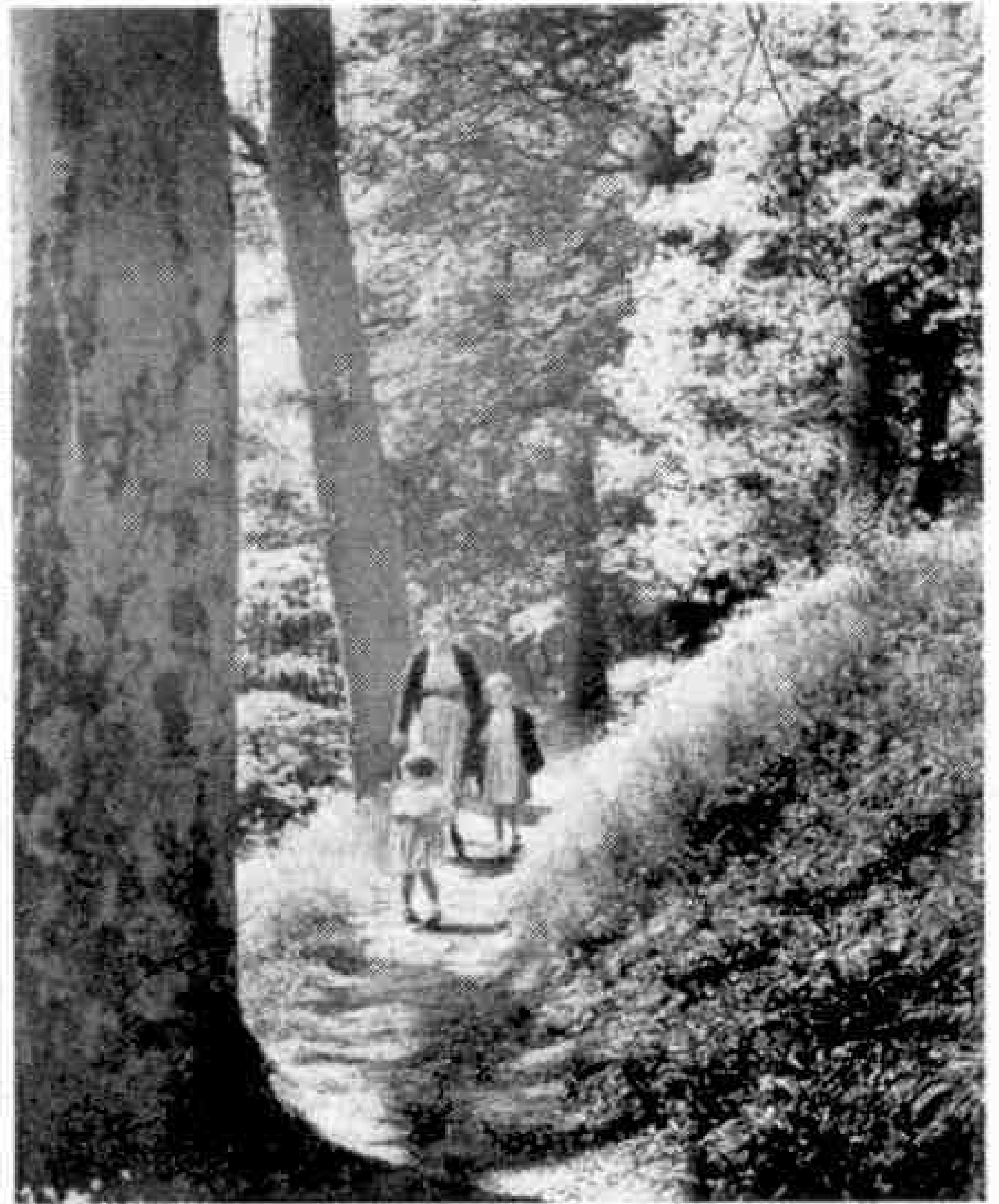
I ALWAYS make a point of strolling through the woods in April, as do a great many other people, who come out from the towns to gather violets and primroses, to enjoy all the freshness of an English wood in Spring, full of the scent of growing things, and the exquisite songs of birds at the height of their powers. From the point of view of things to see and



Gathering Anemones.

photograph, the oak woods are the best, as distinct from the conifers. Growing on clay, the mixed oak woods abound in flowers in the Spring, with violets and primroses, and great masses of wild anemones, like huge patches of snow under the dark trees. The neglected woods by the wayside are much better than the carefully tended game preserves, all plastered with notices threatening dire penalties for trespass, and gamekeepers are seldom met with in the former.

I like to find a flower-strewn path wandering away through the wood, and to set up the camera on the tripod, leisurely making a number of exposures from different viewpoints, trying to use the trees to form a well-composed picture. White flowers under dark trees are not easy to photograph, but giving generous exposure and cutting down development time a little helps to reduce the excessive contrast. A fast film is valuable for this type of subject, as photographs under trees may need some ten times increase in exposure over those taken outside in bright light. If in doubt give a few exposures at different speeds, allowing plenty as the light is deceptive. A pale yellow filter will give a better rendering of the flowers. This needs some



A sunny path in the woods. The illustrations to this article are from photographs by the author.

increase in exposure, as does stopping down the lens considerably in order to gain as much depth of focus as possible.

It will be seen that a tripod is almost necessary, but if one is not available the camera may be pressed close to the trunk of a tree during exposure, which will greatly minimise risk of camera shake. Probably few people can hold a camera perfectly steady for an exposure much less than 1/100 sec., and many experts attempt a minimum of half this to ensure really sharp pictures which will enlarge well.

Trying to photograph a large mass of white anemones may be disappointing, but interesting pictures may be made of a few flowers grouped naturally round the base of a tree. Find a group in a sheltered position, for the anemone is also known by the name of "Wind Flower," and the slightest breeze will set their heads nodding, resulting in fuzzy pictures, which are never satisfactory.



Woodland dell with anemones.

HOW THINGS ARE MADE:

Tennis Rackets

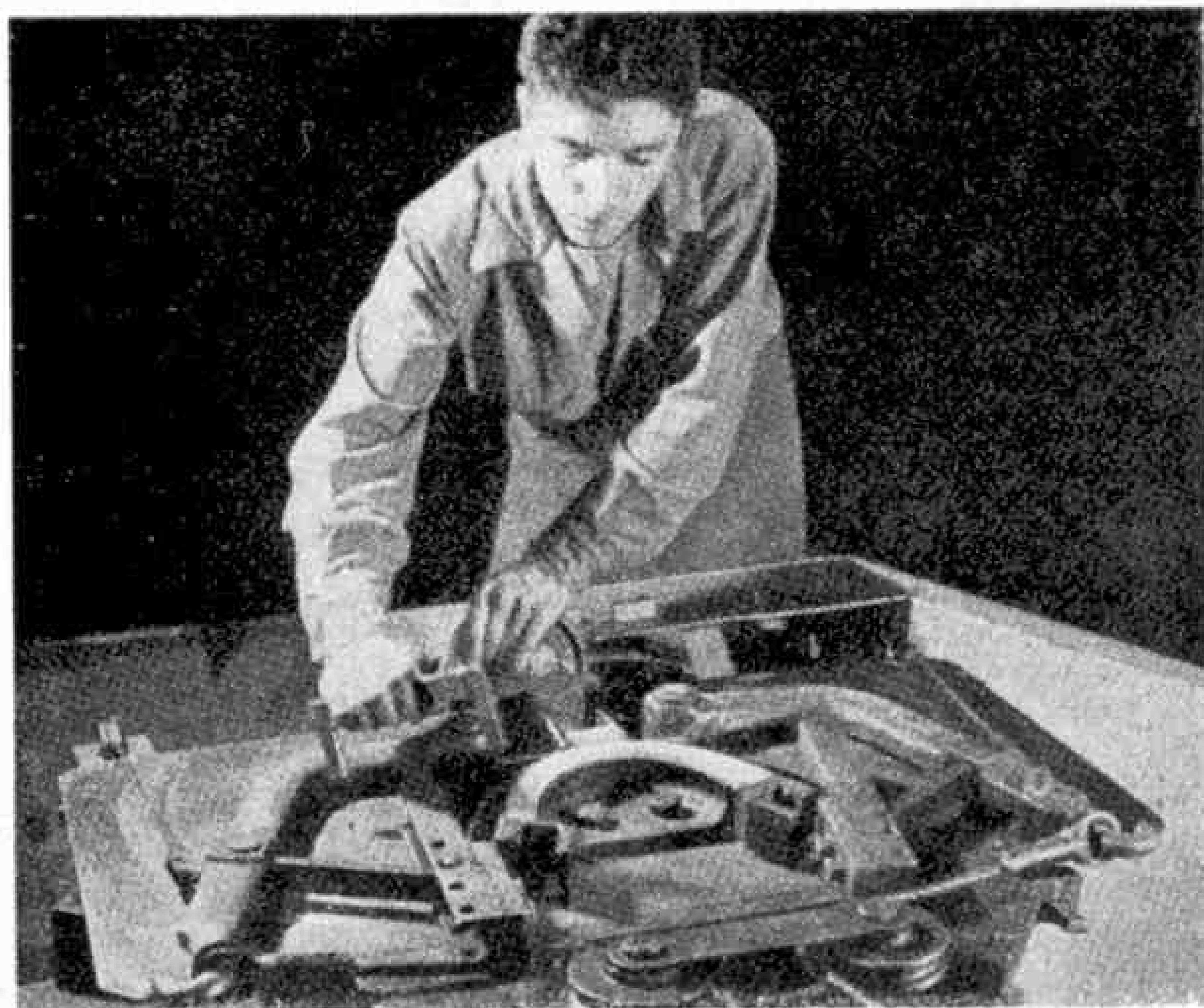
DO you know how many strips and pieces of wood are required to make up a modern first-class tennis racket? This is indeed a surprisingly complex production, with as many as 25 parts, and the various woods used come from many different parts of the world. The main frame and the handle, for instance, are made up of nine laminations or strips of ash and beech from England, birch from Canada and hickory from the United States. These are all strong, tough and fairly heavy woods. The "throat" of the frame is of light mahogany from West Africa or English sycamore, both of them woods that are beautifully grained. Then there are eight handle pieces, made from mahogany or from a light Nigerian wood

be very carefully prepared. For instance, the ash, which arrives in the form of logs, is first sawn into short working lengths, which in turn are sawn lengthwise into quarters and again into planks. The planks are dried in kilns in which the moisture in them is reduced to exactly 12 per cent. by careful temperature control. This takes from one to four weeks, according to the type of wood and the amount of moisture it contains. Kilning is better than outdoor seasoning, which will not reduce the percentage of moisture in them to so low a point. The dried wood is stored in chambers with strictly regulated humidity, in order to prevent any change in its moisture content.

The utmost precision must be used in preparing the wood components of a racket for assembly. The laminations for the frame and handle are prepared in strips exactly 63 inches in length and sometimes only $1/16$ th of an inch in thickness, from planks of ash, beech and hickory, and their thickness must be accurate within two thousandths of an inch. The wedge pieces for the throat, cut from sycamore or light mahogany, are gripped in special jigs in which they are accurately shaped, and they are given a very high finish in what is called a routing machine, with tools revolving at 24,000 revolutions a minute. They are then ready for glueing into the frame.

Making the crescent shaped slices that form the shoulders of the racket is interesting. Sturdy blocks

of ash are treated in a steam oven until they can be curved to the shape required in a powerful bending machine. When these are dry and set they are sawn into thin smooth slices. The face pieces for the handle are formed from obeche, the light wood already mentioned, the planks of which are cut accurately into slats on a high speed machine. Their purpose is



Bending a steamed block of ash to correct shape. From it thin smooth slices are cut to form the shoulders of a tennis racket. The illustrations to this article are reproduced by courtesy of the Dunlop Rubber Co. Ltd.

called obeche.

The general idea of constructing rackets is that the hardest wearing woods should be used for surfaces, and that these should be supported by more flexible varieties such as English ash—which combines great strength and toughness with ample flexibility—or Canadian birch.

The woods used in making rackets must



The first stage in building up a racket. Nine laminations or strips of suitable wood bonded by a plastic glue are given the characteristic shape by hydraulic pressure in this machine.

to reinforce the handle, and bring it up to correct shape and size without adding much to the total weight of the racket.

From these components the racket itself is next built up. To begin with, the laminations for the frame are spread out in sets of nine for each frame on a glueing table, and coated in a machine with a plastic glue that is water proof, heat proof, and rot proof. The bonding it gives indeed is stronger than the wood itself.

Next the glued laminations are placed in a glueing machine. The insertion and the wedge pieces are placed in position and hydraulic pressure is applied progressively from the top of the racket head down to the throat, and then along the handle, a proceeding that gives the assembly its characteristic shape. This is made permanent by transferring the clamped assembly to a curing oven, in which the synthetic glue is set. This takes about 45 minutes, after which the clamps are removed, leaving what is called

the "glued bend" ready for machining.

Both faces of the racket head are planed smooth and perfectly flat, the thickness being reduced at the same time to that required to give a racket of one or other of the standard weights. The crescent is next glued in position, and this is followed by the handle pieces, after which the handle ends are trimmed. Finally, the crescent and the handle surface are machined to correct shape on a special machine.

The next operation is to drill the 64 holes through which the strings of the racket pass. These are of two different sizes, for the gut is passed twice through some of them. A special machine with a ring of drilling heads is used for this operation. The holes are drilled at three different angles round the outside of the bow so as to leave as much wood as possible between them, and they are planned to allow strain from the strings to be carried across the grain of the wood as well as along it. Grooves to connect each pair of holes are carefully cut and then rounded off so that they will not damage the gut when it is pulled taut.

Machining and sanding operations bring the racket steadily nearer to its finished playing perfection, and the frame is finished off by a hand craftsman, who smooths off every rough spot and gives it complete symmetry. (Continued on page 222)



A racket in the stringing machine, which automatically gives the required tension.

Among the Model-Builders

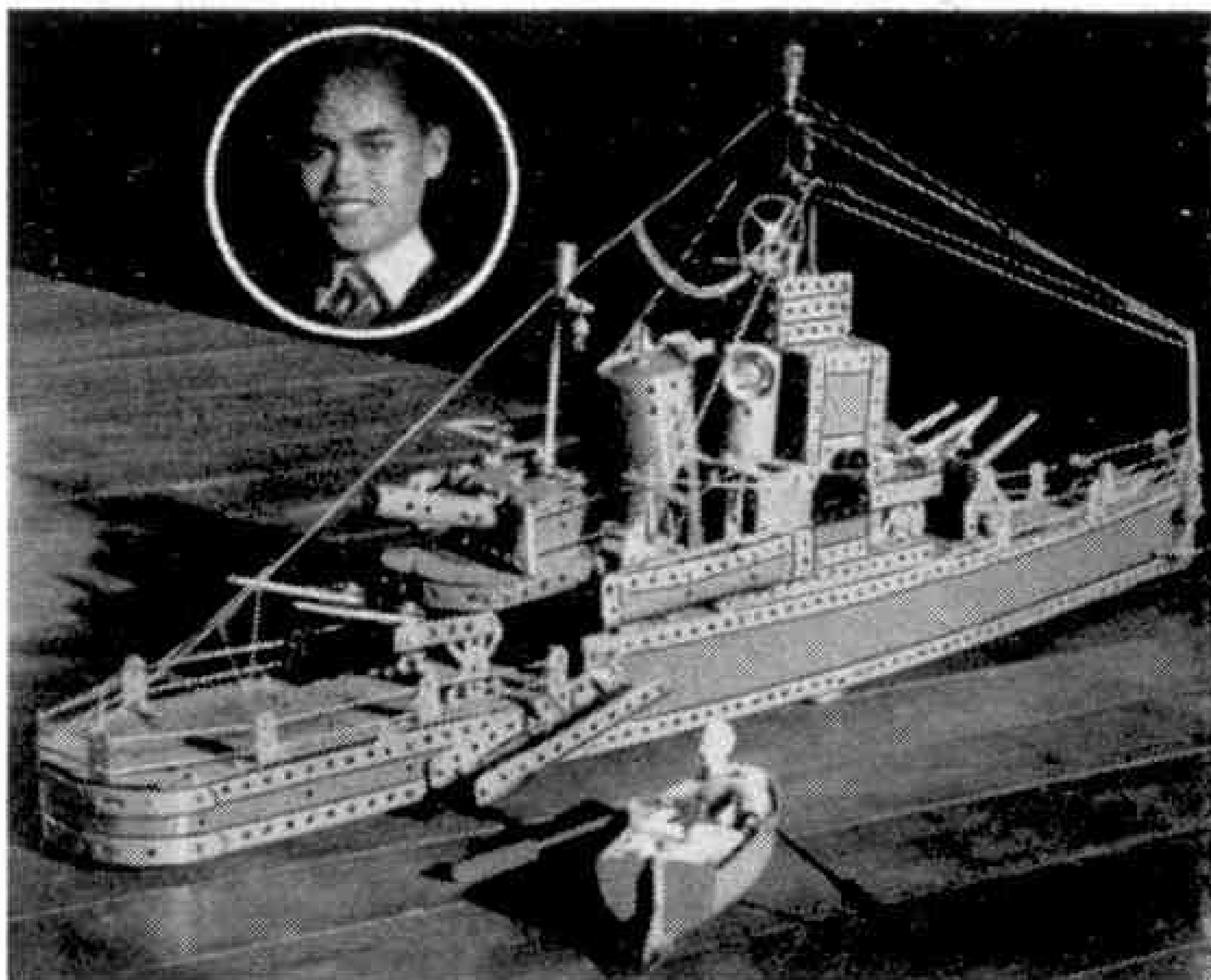
By "Spanner"

A Self-Adjusting Winding Drum

Builders of model cranes can introduce a little novelty into their work by making use of the interesting device shown in Fig. 1. This is a special form of expanding winding drum, which automatically varies its effective diameter so as to handle most easily loads of different weights. It will be seen from Fig. 1 that the expanding drum consists of two $2\frac{1}{2}$ " Strips, which are mounted on Pivot Bolts inserted in the tapped holes of Collars located on the crane winding shaft.

When the crane is engaged in hoisting only a light load the drum is well expanded, but when a heavier load is placed on the crane hook the drum contracts. In this manner a gain is brought about in the mechanical advantage of the machine, which means that a heavy load can be hoisted with smaller motor power than would be required with a drum of larger diameter.

Fig. 1 is intended to explain the principles of the device, and of course the actual constructional details can be varied to suit the builder's requirements.



Seen here with a fine warship he has built is young Jack Lin, who lives at Moulmein, Burma. Jack is a keen Meccano boy, and is one of my regular correspondents.

An Automatic Reversing Mechanism for Small Models

Many models such as pile-drivers, lifts and pit-head gears, can be made much more effective if they are fitted with automatic mechanism to enable them to operate without attention once the driving Motor has been started. This does not present any great difficulty with models of the larger type, which are usually operated by Electric Motors, and several automatic reversing mechanisms suitable for such models have been described in

past issues of the *M.M.* Automatic working need not be confined only to large and complicated models however, and for the benefit of those who have only small Outfits I am describing a very simple automatic reverse, which I recommend for their attention. It is designed for use with a No. 1 Clockwork Motor and it requires very few parts. Model-builders who possess a Gears Outfit "A" will find this mechanism particularly suitable for their use, as all the Gears needed are included in that Outfit.

In the mechanism illustrated in Fig. 2 a $2\frac{1}{2}$ " \times 1" Double Angle Strip 1, bolted to a No. 1 Clockwork Motor, provides bearings for the sliding shaft, but of

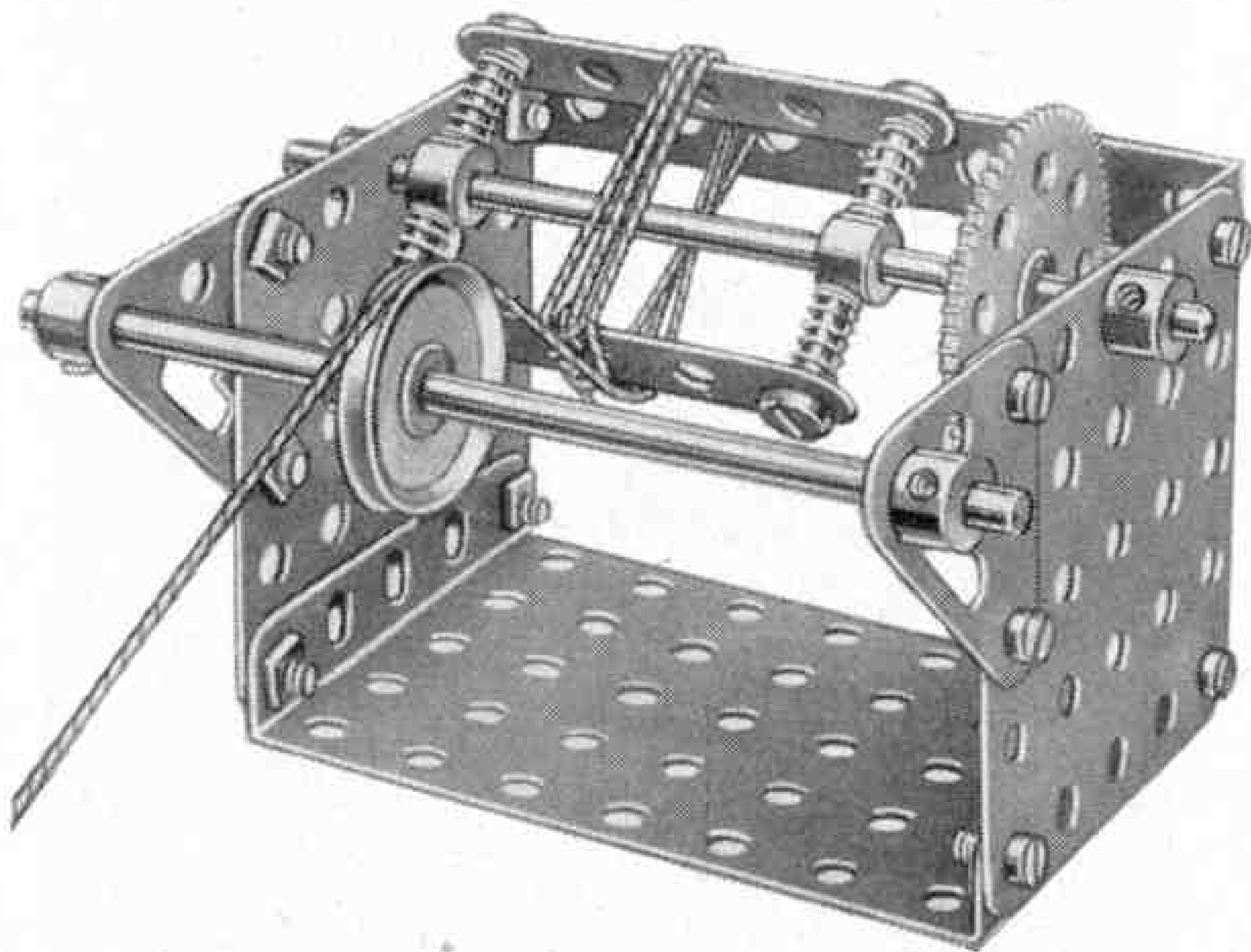


Fig. 1. A novel self-adjusting winding drum, which alters its effective diameter to suit varying loads.

course this arrangement can be modified to suit a particular model. In many cases it will be possible to mount this shaft in the main structure of the model.

The sliding shaft is a 5" Rod and it is fitted with two $\frac{3}{4}$ " Pinions 2 and 3 that can be meshed with a $\frac{3}{4}$ " Contrate fixed

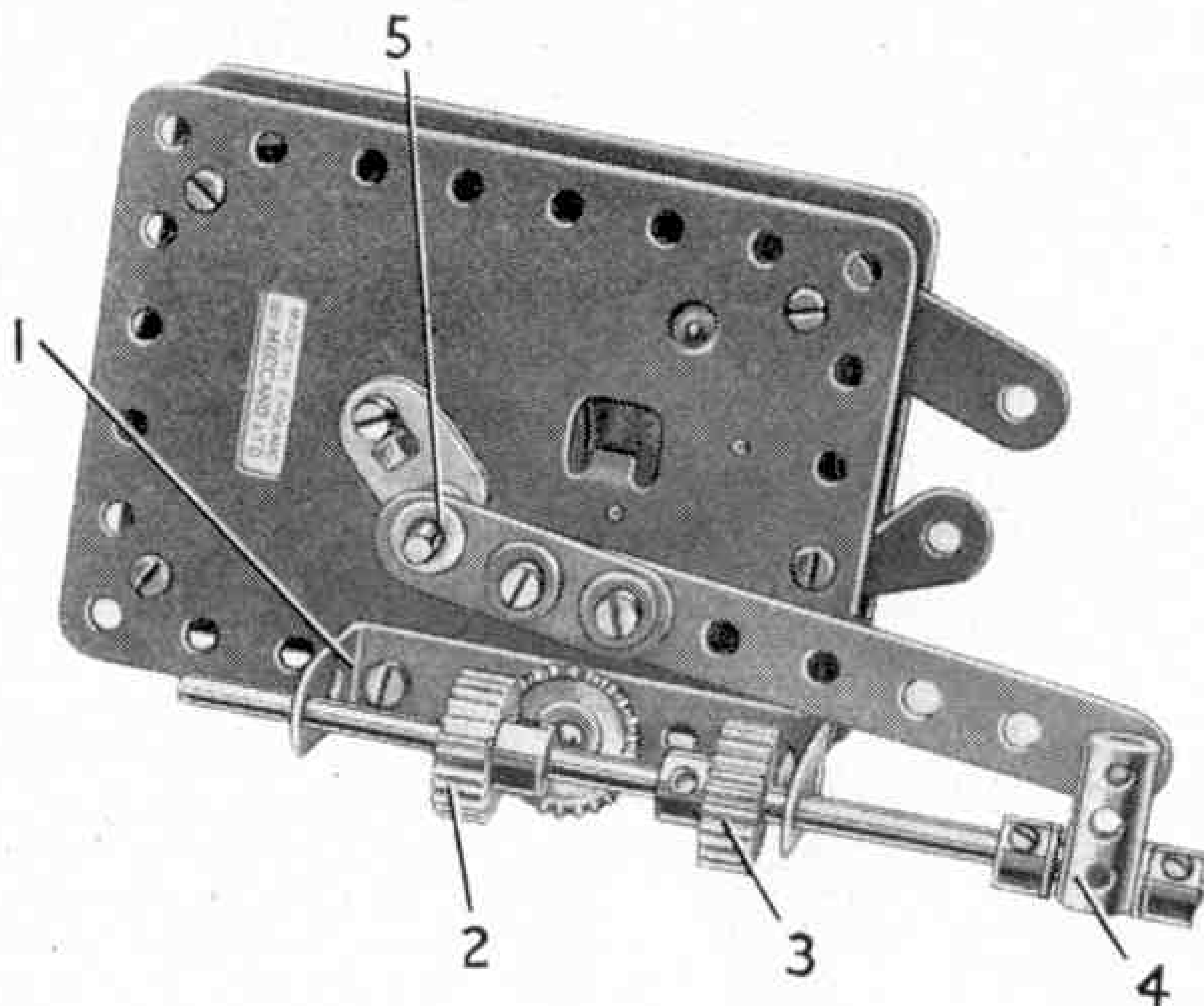


Fig. 2. Model-builders requiring an automatic reversing movement may find the suggestion shown here helpful. It is fitted to a No. 1 Clockwork Motor.

on the Motor driving shaft. The 5" Rod carries also a Coupling 4, which is located loosely between two Collars.

The shaft is moved from side to side by a crank fitted to the Motor winding shaft. This crank is made from four Fishplates arranged with their slotted holes over the winding shaft, and a bolt is then passed through the free portions of the holes and is fitted with a nut. This method of construction locks the Fishplates securely to the shaft. A $\frac{3}{4}$ " Bolt is held by a nut in the round holes of the Fishplates.

The Fishplates are connected to the sliding shaft by a $3\frac{1}{2}$ " Strip extended by a Crank 5, which is slipped over the $\frac{3}{4}$ " Bolt. The free

end of the Strip is pivoted on a bolt fixed by a nut in one of the threaded holes of Coupling 4.

As the Motor unwinds the 5" Rod is moved from side to side under the action of the crank on the winding shaft, and this movement brings each Pinion in turn into engagement with the $\frac{3}{4}$ " Contrate. The direction of rotation of the 5" Rod is reversed at regular intervals, with a brief neutral period between each changeover. The Crank 5 should be removed from the $\frac{3}{4}$ " Bolt before the Motor is rewound.

* * * *

It is sometimes necessary in the construction of models such as cranes, to apply a slight constant pressure to a gear change lever in order to prevent it from slipping. This can be accomplished by making use of a Spring Clip in the following manner: The Spring Clip is fitted at one end of the shaft carrying the gear-change lever. The shaft is mounted in the top hole of a Flat Trunnion, and in the hole immediately below it a $\frac{1}{2}$ " \times $\frac{1}{2}$ " Angle Bracket is fixed. The Bracket is secured in place by

a nut and bolt, the elongated hole of the part being used for this purpose in order to allow adjustments to be made. The two lugs of the Clip are arranged in contact with the Angle Bracket, and in this way the gear lever Rod is prevented from being shifted from its pre-set position by any vibration set up when the model is working.

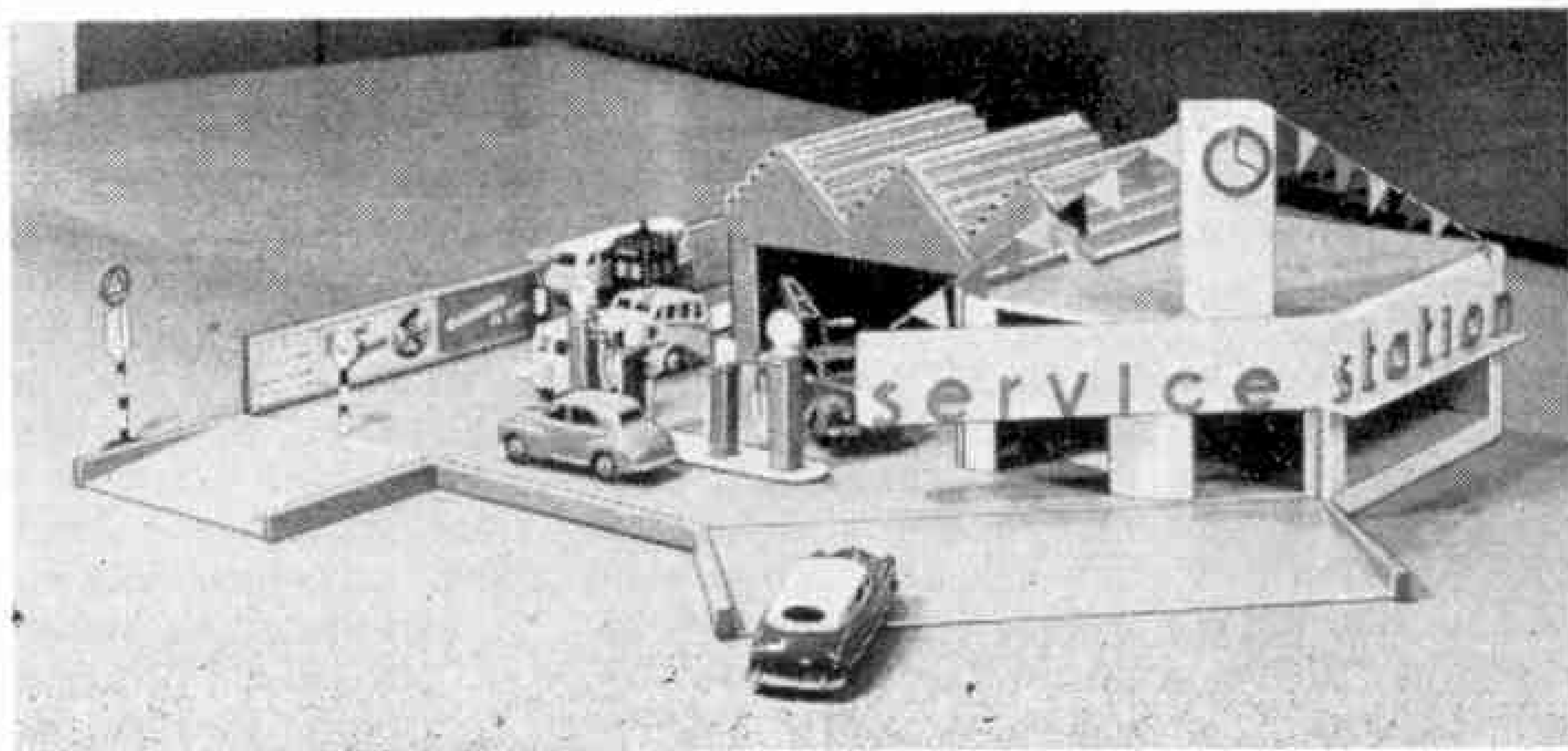


Fig. 3. The young son of Mr. E. Shallis, Fishponds, Bristol, is the lucky owner of this attractive miniature Service Station. Mr. Shallis built it for use with his son's Dinky Toys collection.

Meccano Special Model

Harbour-Building Crane

THIS month we continue the constructional details of the fine Meccano harbour-building crane that was illustrated on pages 140 and 141 of the March issue of the *M.M.* Last month we described the construction of the tower and the boom; now we are dealing with the mechanism and the special block-lifting gear, which are shown in the accompanying illustrations.

The power unit and mechanism are assembled as a unit on a platform made by bolting two $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plates between two $12\frac{1}{2}"$ Angle Girders 18 (Fig. 2). The winding shafts are mounted in $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flat Plates 19 bolted to the forward ends of the Angle Girders, and an E20R Electric Motor is bolted to the $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate fixed between the rear ends of the Girders. The Flat Plates 19 are connected by two $3\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips.

A $\frac{1}{2}"$ Pinion on the Motor armature shaft engages a 57-tooth Gear on a 3" Rod 20. This Rod carries a Worm that meshes with a 57-tooth Gear on a $1\frac{1}{2}"$ Rod, which carries also a 1" Sprocket 21. The bearings for the $1\frac{1}{2}"$ Rod are provided by 2" Flat Girders bolted to two 2" Angle Girders arranged in U-shape and fixed to the Motor side-plate.

Sprocket 21 is connected by Chain to a $\frac{3}{4}"$ Sprocket on a Rod mounted in the Flat Plates 19. The Rod is fitted with a $1\frac{1}{2}"$ Sprocket 22, and with two $\frac{1}{2}"$ Pinions that are arranged with the boss of each placed against one of the Flat Plates. These Pinions are in constant mesh with 57-tooth Gears 23 and 24, and the Gears are loose on the hoisting and bogie-operating shafts respectively.

The hoisting shaft is mounted in the

Flat Plates 19, and in addition to the Gear 23 it carries a Collar 25, a 1" Pulley with a Rubber Ring, a $\frac{3}{4}"$ Washer, two Bush Wheels, a Collar 26 and a Compression Spring 27. The Compression Spring is fitted between a Collar and the Flat Plate, and normally it holds the 1" Pulley away

from Gear 23. A $\frac{3}{8}"$ Bolt in Collar 26 engages a $\frac{3}{8}"$ Bolt in the Flat Plate and acts as a brake. The 1" Pulley can be forced against the Gear 23 by moving a Rod 28. This Rod is fitted with a Coupling between

the Flat Plates 19, and two $2\frac{1}{2}"$ Rods held in the Coupling bear against the $\frac{3}{4}"$ Washer, so that the Rod can be used to press the Pulley against the Gear. The sliding action of Rod 28 also disengages the $\frac{3}{8}"$ Bolt in the Collar 26 and thus automatically releases the brake.

The drive to the bogie operating shaft is arranged in a similar way, except that the Compression Spring is on the opposite side of the mechanism, and Rod 29 must be pulled instead of pushed to force the 1" Pulley against its Gear 24. The carriage shaft is fitted with two 1" Pulleys 30 in place of the Bush Wheels on the hoisting shaft.

Sprocket 22 is connected by Chain to a 1" Sprocket on a Rod 31, which is fitted

with two Worms and is mounted in $1\frac{1}{2}"$ Strips bolted to the Flat Plates 19. The $\frac{1}{2}"$ Pinions 32 and 33 can be slid into mesh with the Worms to drive the slewing and travelling motions.

Pinion 32 is fixed on a Rod mounted in two $1" \times 1"$ Angle Brackets, and a $\frac{1}{2}"$ diameter, $\frac{1}{2}"$ face Pinion on this Rod is in constant mesh with a $1\frac{1}{2}"$ Contrate on a Rod 34. Rod 34 is mounted in a $5\frac{1}{2}"$ Strip 36, and is connected by a

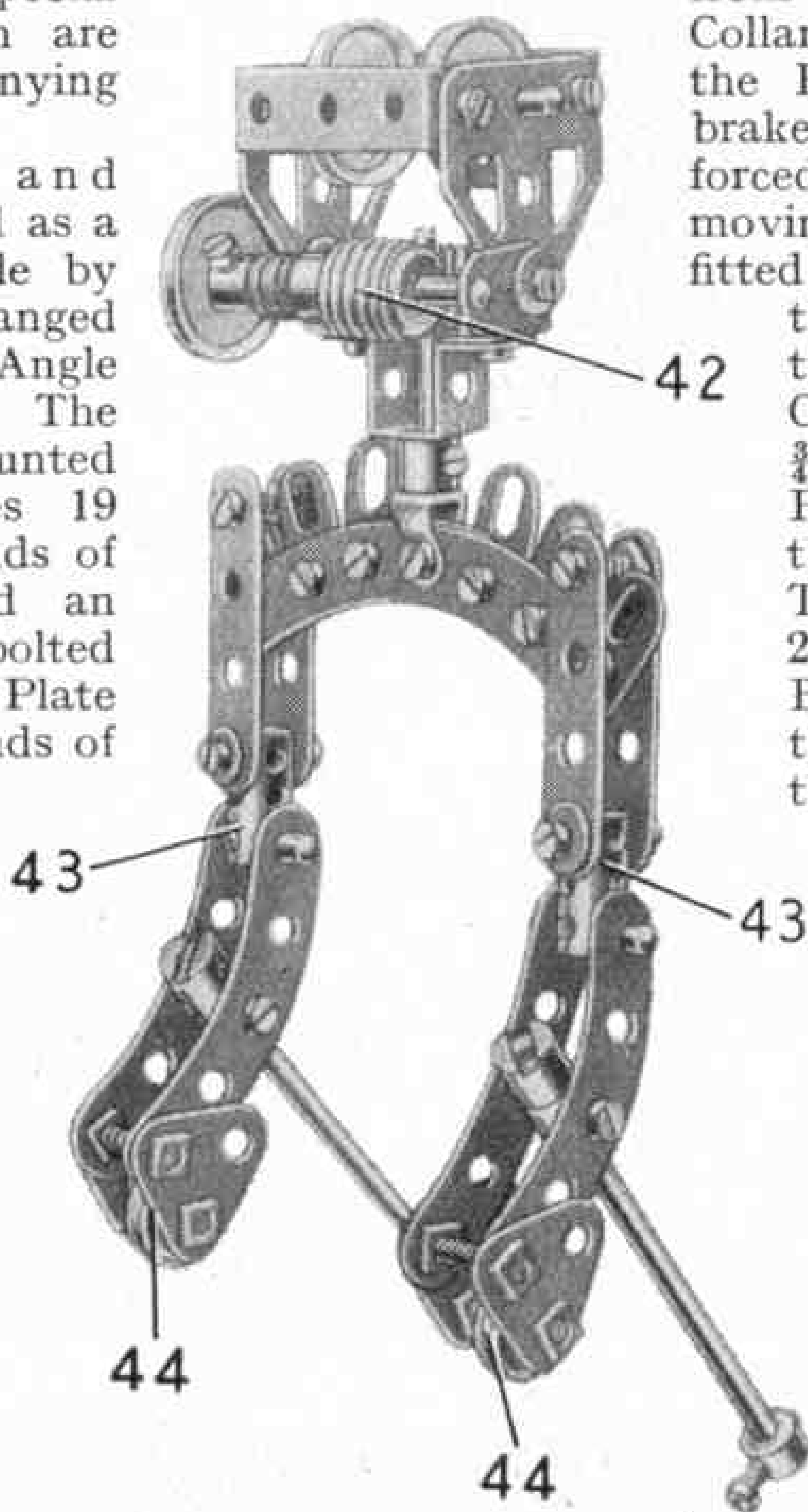


Fig. 1. This special block-lifting tackle is designed to set concrete blocks at an angle, as required in building breakwaters on the inclined bond system.

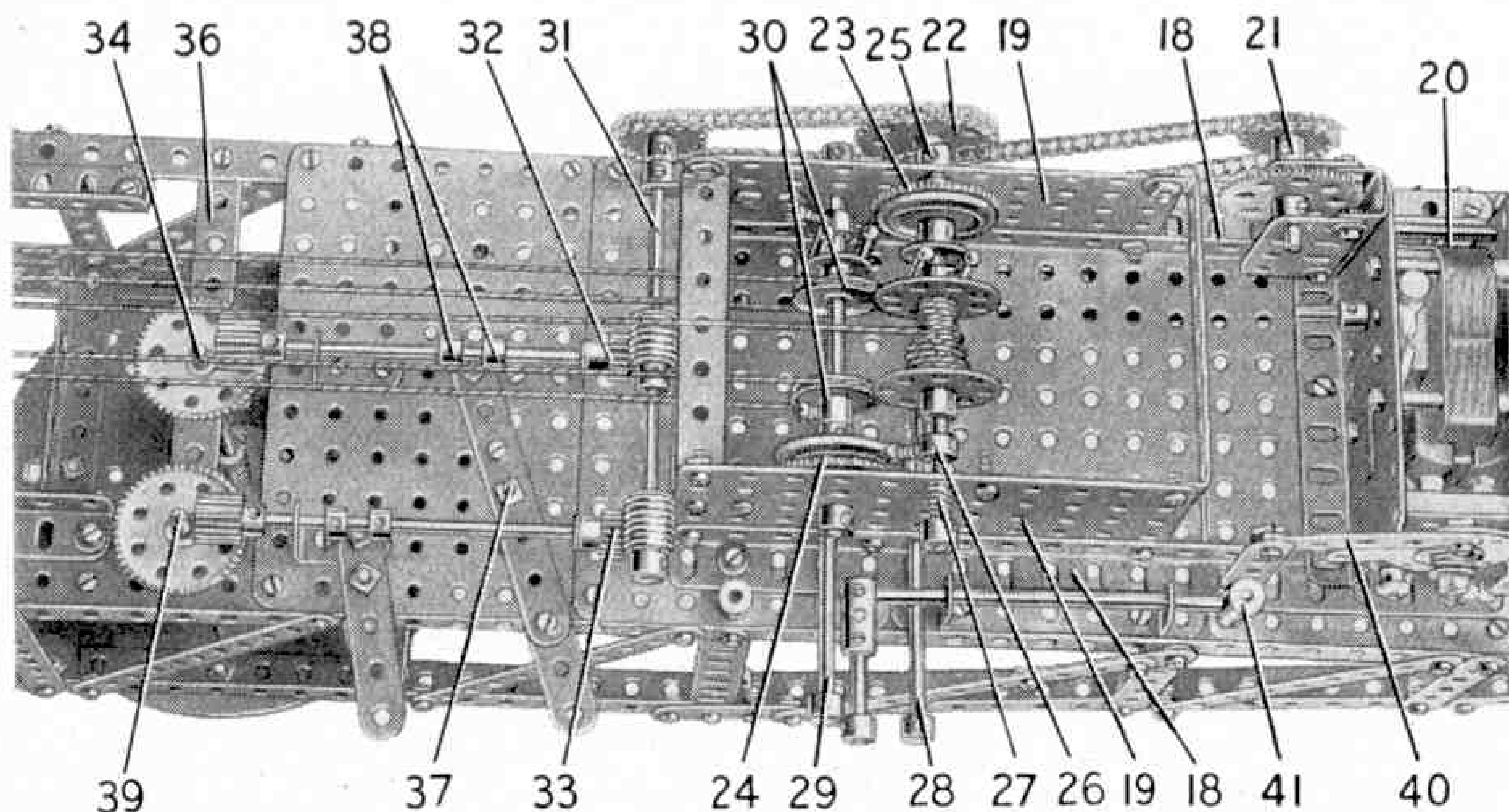


Fig. 2. Arrangement of the Motor and driving mechanism of the Harbour-Building Crane.

Coupling to Rod 6. The sliding movement of Pinion 32 is controlled by a lever made from two $3\frac{1}{2}$ " Strips overlapped five holes. The lever pivots on a $\frac{3}{4}$ " Bolt 37, and is spaced on the Bolt by Washers so that a bolt placed in the end hole of the lever engages between two Collars 38.

The drive to Rod 39 is similar to that for Rod 34, but the lever is a $2\frac{1}{2}$ " Strip. Rod 39 is $6\frac{1}{2}$ " in length and is mounted in Strip 36 and in the 6" Circular Plate of the boom. It is fitted at its lower end with a $\frac{1}{2}$ " Pinion that engages with the $3\frac{1}{2}$ " Gear 5.

A $2\frac{1}{2}$ " Strip 40 is lock-nutted to the Motor switch, and is bolted tightly to a 2" Strip connected to a Coupling 41. This Coupling is fixed on a Rod that is free to slide in a $2\frac{1}{2} \times 1$ " Double Angle Strip and is fitted with a handle formed by a $1\frac{1}{2}$ " Rod held in a second Coupling.

The carriage is operated by two Cords. Each of these is tied to the front of the carriage, and is passed round one of the Pulleys 15 and one of the Pulleys 30. It is then tied to a Tension Spring, which is stretched slightly and is connected by Cord to the rear of the carriage.

The pulley block consists of two Flat Trunnions connected by three $1\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strips, and it is fitted with a 2" Rod and two 1" loose Pulleys held in place by Collars. The hoisting Cord is tied between the Bush Wheels on the hoisting shaft, and is led over one of the Pulleys 17 and one of the Pulleys in the block. It is taken again round one of the

Pulleys 17 and the remaining Pulley in the block, then is led over the third Pulley 17 and is tied finally to Double Angle Strip 14.

The block-setting tackle is shown complete in Fig. 1. A Double Bent Strip is bolted to the underside of the pulley block, and a $1\frac{1}{2}$ " Rod mounted in it is fitted with a $\frac{1}{2}$ " Pinion and an End Bearing. A Worm 42 on a 2" Rod passed through Fishplates engages the Pinion, and two $2\frac{1}{2}$ " Curved Strips overlapped three holes are held in the End Bearing.

The lifting tackle consists of two links, each made in the same way. Two 2" Strips connected by a $\frac{3}{4}$ " Bolt are fixed on each side of a Coupling 43, and two $2\frac{1}{2}$ " Curved Strips pivot on a 1" Rod held in the Coupling. A 1" Triangular Plate is bolted to each Curved Strip, and a $\frac{1}{2}$ " loose Pulley 44 is mounted on a $\frac{3}{4}$ " Bolt held by nuts in the Triangular Plates. The lifting bar is a $3\frac{1}{2}$ " Rod fitted with half a Dog Clutch and a Collar, and it is passed through a Collar pivoted on bolts in the centre holes of the Curved Strips.

The model is completed by attaching a simple cab to Rod Sockets fixed to the boom. A gap is arranged in one side of the cab to accommodate the control levers, and a cover plate is placed over the exposed gearing.

Parts required to construct the model Harbour-Building Crane: 3 of No. 1; 3 of No. 1a; 4 of No. 1b; 22 of No. 2; 12 of No. 2a; 12 of No. 3; 22 of No. 4; 32 of No. 5; 13 of No. 6; 11 of No. 6a; 6 of No. 7; 2 of No. 7a; 6 of No. 8; 8 of No. 8a; 12 of No. 8b; 10 of No. 9; 4 of No. 9a; (Continued on page 222)

New Meccano Models

Climbing Monkey—Three-Wheel Car

AN opportunity for model-builders to indulge in the lighter kind of Meccano construction is provided by the amusing model shown in Fig. 1. It is a small "monkey" that can be made to climb vigorously up or down a piece of Cord, simply by jerking the Cord. The body of the monkey consists of two $3\frac{1}{2}$ " Strips joined by Double Brackets at 1 and 2. The Bolt 2 that fixes one of the Double Brackets in position holds also the monkey's arms, and a third Double Bracket is held in position by the 1" Screwed Rod 3. The nuts are left sufficiently loose on the Rod to allow the legs to pivot freely. The legs are made from 2" Strips, with feet consisting of Fishplates, and they are connected at 4 by a $\frac{3}{4}$ " Bolt lock-nutted in position. The ends of the Spring 5 are looped over the Screwed Rod 3 and $\frac{3}{4}$ " Bolt 4, and the $\frac{3}{4}$ " Bolt 6 passes through the loop so formed. Two $\frac{3}{4}$ " Bolts are pushed through the Fishplates forming the feet and are fitted in place by lock-nuts, one of the Bolts 7 carrying six Washers.

The back of the body is a 3" Strip, which supports a stepped Bent Strip 8. The $\frac{1}{2}$ " Bolt 9 carries a $\frac{1}{2}$ " loose Pulley, around which a Spring is looped, the ends of the Spring being anchored on the $\frac{3}{4}$ " Bolt 10.

The monkey is completed by fitting its head and by joining the ends of its arms with a Double Bracket. A piece of Meccano Cord is now threaded through the Double Bracket, then around the $\frac{3}{4}$ " Bolt 7 connecting the feet, and up over the second $\frac{3}{4}$ " Bolt. The Cord is fitted at each end with a 1" Pulley.

To make the monkey climb, the Cord is pulled taut, thus causing the legs to

straighten and move the body upward and forward. As it does so the Cord is gripped between the coils of the upper Spring. On releasing the tension of the Cord the legs move up under the influence of the lower Spring, ready for the next movement.

Parts required to build the Climbing Monkey: 2 of No. 3; 1 of No. 4; 4 of No. 6; 3 of No. 10; 4 of No. 11; 2 of No. 22; 1 of No. 22a; 1 of No. 23; 9 of No. 37; 23 of No. 37a; 8 of No. 38; 1 of No. 40; 2 of No. 43; 1 of No. 44; 1 of No. 82; 2 of No. 90; 4 of No. 111; 1 of No. 111a; 1 of No. 111c.

Three-Wheel Sports Car

The natty three-wheel sports car shown in Figs. 2 and 3 is quite simple in construction. The chassis consists of two $5\frac{1}{2}$ " Strips 1, connected by a $1\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip 2 and attached by Angle Brackets to a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip 3. A

Magic Clockwork Motor is bolted to the chassis as shown in Fig. 3, and the Motor pulley is connected by a Driving Band to a 1" Pulley on the rear axle. The axle is a 2" Rod held in place by a Spring Clip. The Motor brake lever is extended by a 1" Rod held in a Rod and Strip Connector fixed to the lever.

Each side of the body is assembled on a $5\frac{1}{2}$ " Strip 4 bolted to the lugs of Double Angle Strip 3 and joined to the chassis by $\frac{1}{2}$ " Reversed Angle Brackets 5. The side is plated by a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate and by a $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Obtuse Angle Brackets to the rear end of $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible the Brackets on each

Plate. Two are fixed e a c h Plate, and side are bolted together.

A $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flanged Plate is bolted between the front ends of Strips 4, and it projects one hole in front of the Strips. Two $2\frac{1}{2}$ " Strips 6 placed face to face, are fixed to the Flanged Plate, and these support a $3\frac{1}{2}$ " Strip 7 that forms the front axle beam.

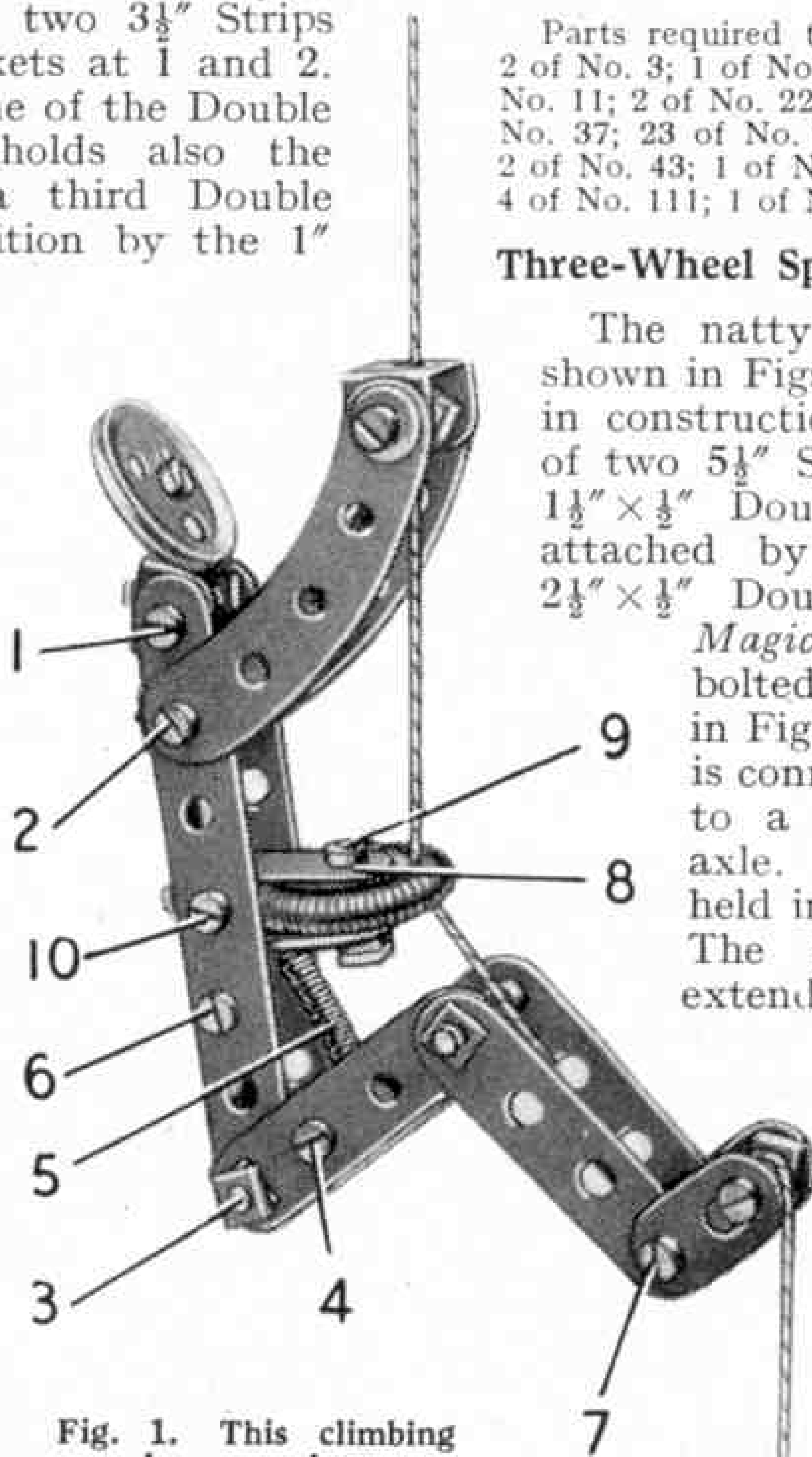


Fig. 1. This climbing monkey makes an amusing toy for the younger members of the family.

The front wheels are each fixed on a $1\frac{1}{2}$ " Rod mounted in a Double Bracket and held in place by a Spring Clip. A $\frac{3}{8}$ " Bolt is passed through a Fishplate and the Double Bracket, and these parts are clamped tightly together by a nut. The Bolt is then passed through one of the end holes of the Strip 7, and is fitted with lock-nuts, so that the Bolt, Double Bracket and Fishplate pivot freely in the Strip. The Fishplates are linked by a second $3\frac{1}{2}$ " Strip attached by lock-nutted bolts, and two Angle Brackets are fixed to this Strip by a Bolt 8 to form a U-shaped piece.

The upper edges of the Flexible Plates that form the sides of the body are braced by $5\frac{1}{2}$ " Strips. The top of the bonnet is a $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate curved as shown in Fig. 2, and the Bolts 9 and 10 that fix the Flexible Plate in

position attach also two $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips placed between the sides of the body. The bonnet is completed by four Formed Slotted Strips.

The radiator cap is a $\frac{1}{2}$ " loose Pulley held by a $\frac{3}{8}$ " Bolt 11 that fixes also an Angle Bracket placed inside the bonnet. This Angle Bracket is used later to fix the radiator in position.

The steering column is a Crank Handle, which is passed through the Double Angle Strip held by Bolts 9 and through a Fishplate bolted to the Double Angle Strip

held by Bolts 10. The grip of the Crank Handle engages between the Angle Brackets fixed by Bolt 8 to the $3\frac{1}{2}$ " Strip of the steering mechanism.

The radiator and front cowl consists of a Semi-Circular Plate bolted to a $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate shaped as shown in Fig. 2. Two 1" Pulleys on $\frac{3}{8}$ " Bolts represent headlamps, and the assembly is fixed to the Angle Bracket attached to the bonnet by $\frac{3}{8}$ " Bolt 11. The rear cowl

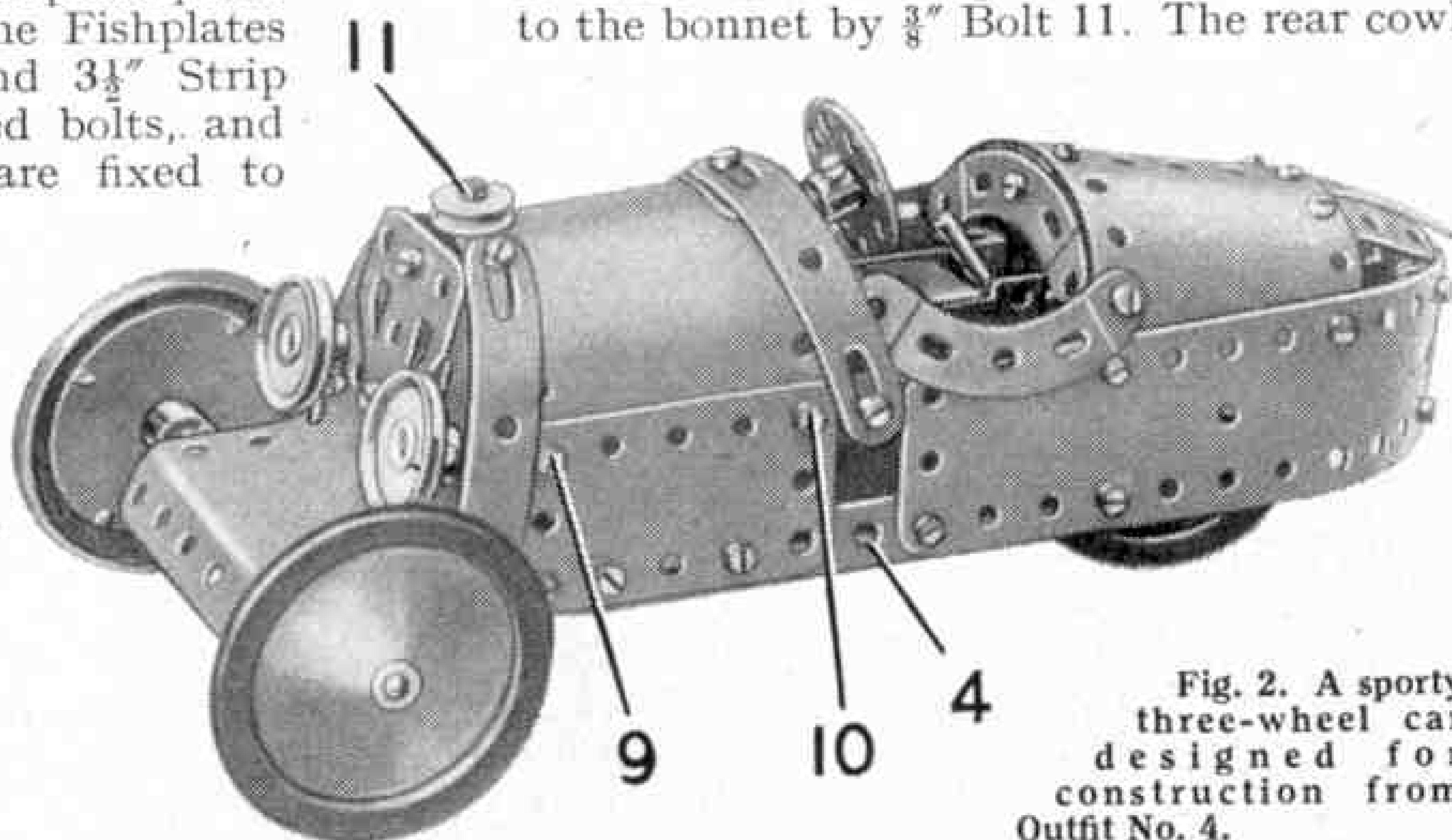


Fig. 2. A sporty three-wheel car designed for construction from Outfit No. 4.

of the car consists of two $1\frac{1}{16}$ " radius Curved Plates bolted at an angle to the $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates and connected together at the centre. The tail is completed by three $2\frac{1}{2}$ " Strips bolted to the $1\frac{1}{16}$ " radius Curved Plates.

Three $2\frac{1}{2}$ " stepped Curved Strips form the sides and rear of the driver's cockpit as shown in Fig. 2.

The Magic Clockwork Motor will drive the model for a considerable distance at a good speed. The Motor can be rewound by inserting the key in the gap left between the $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " and $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates that form the sides of the body.

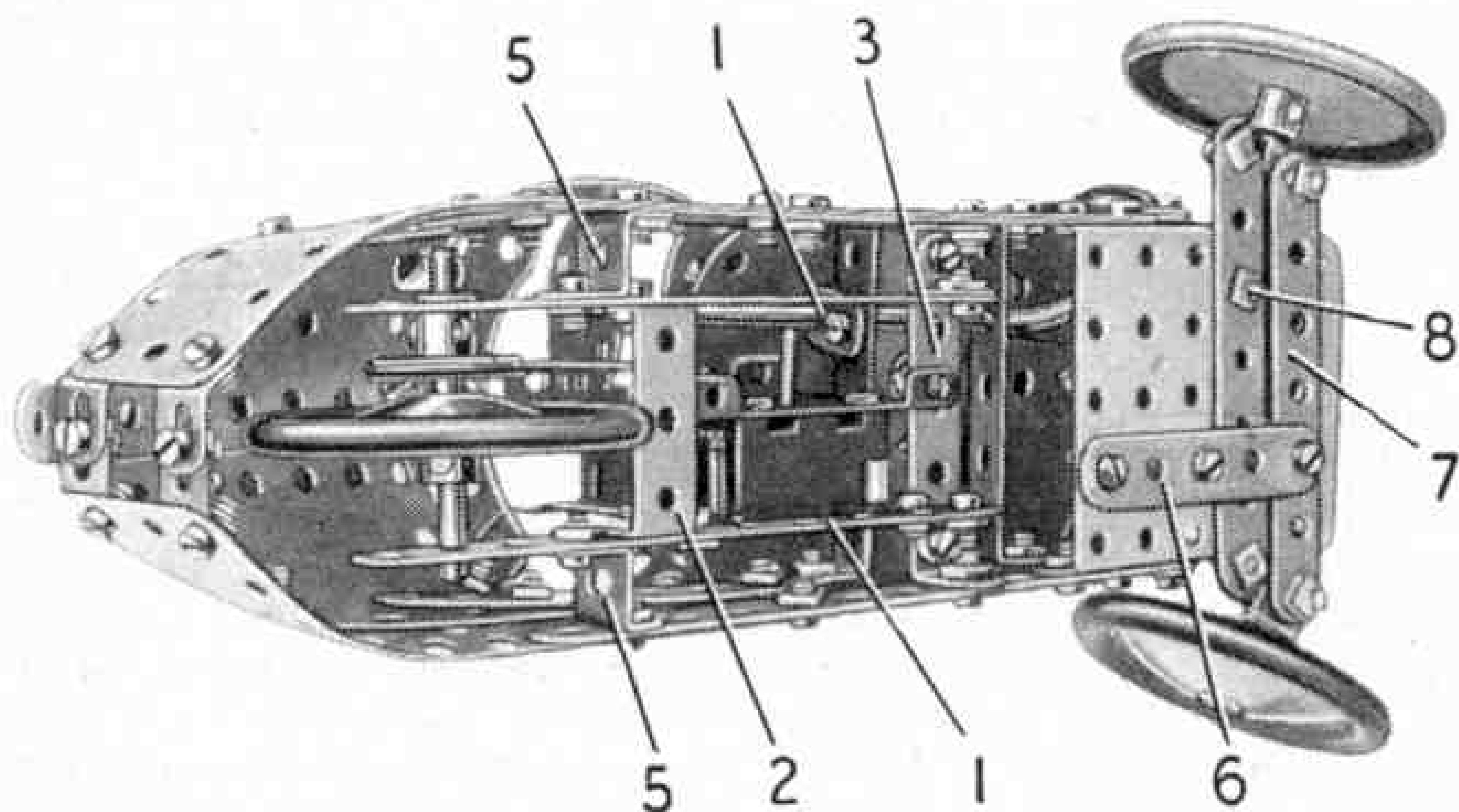


Fig. 3. An underneath view of the car that shows how the Motor is fitted, and the steering mechanism.

Parts required to build the Three-Wheel Sports Car: 6 of No. 2; 2 of No. 3; 5 of No. 5; 3 of No. 10; 2 of No. 11; 6 of No. 12; 4 of No. 12c; 1 of No. 17; 2 of No. 18a; 1 of No. 18b; 1 of No. 19g; 3 of No. 22; 1 of No. 23; 1 of No. 24; 5 of No. 35; 57 of No. 37; 10 of No. 37a; 7 of No. 38; 1 of No. 48; 3 of No. 48a; 1 of No. 51; 3 of No. 90a; 6 of No. 111c; 2 of No. 125; 2 of No. 126a; 3 of No. 187; 2 of No. 188; 2 of No. 189; 1 of No. 190; 1 of No. 191; 2 of No. 200; 1 of No. 212; 1 of No. 214; 4 of No. 215; 1 Magic Clockwork Motor.

Coronation Model-Building Competition

ALTHOUGH the great International Model-Building Competition is now closed for entries, another fine opportunity for model-builders to win valuable prizes is provided by the special *Coronation Competition*, which is now running.

Full details of this Contest first appeared in the January issue of the *M.M.*, and we are repeating them here for the benefit of any readers who may not have seen that issue.

In the *Coronation Competition* prizes

will pass. The architectural model illustrated on this page shows the fine effects that can be obtained with subjects of this kind.

The Competition is open to model-builders living in any part of the world, and there are no age limits. *Entries may be sent in at any time up to 31st May next.*

The prizes to be awarded for the best models received are as follows:

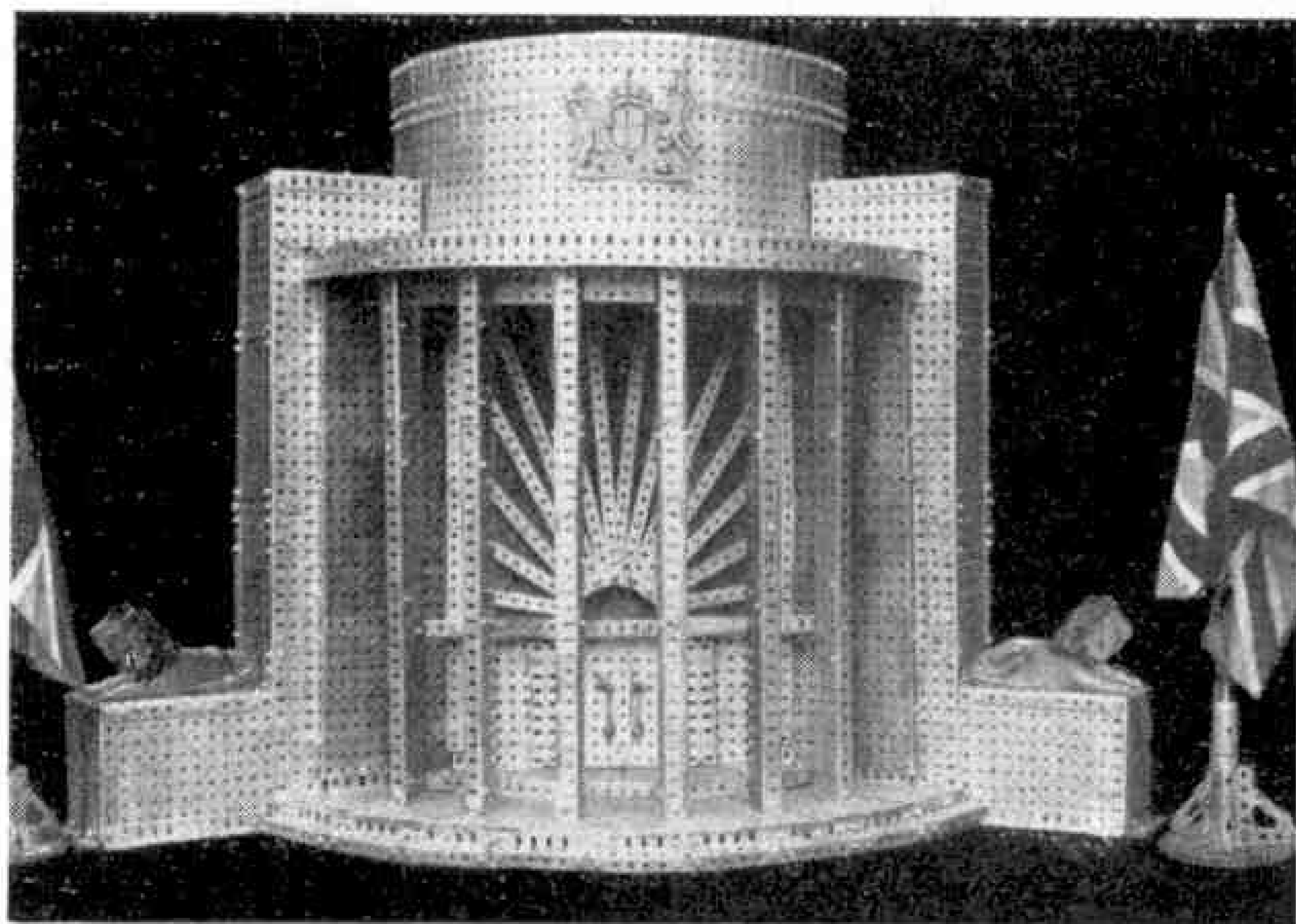
First, Cheque for £5/5/-. Second, Cheque for £3/3/-. Third, Cheque for £2/2/-. There will be also Twenty Prizes each of £1/1/-, and Twenty Prizes each of 10/6. Certificates of Merit will also be awarded.

Photographs or drawings of models only are required. *Actual models must not be sent.* Entries should be addressed to *Coronation Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13.*

THE MECCANO INTERNATIONAL MODEL-BUILDING COMPETITION

The Meccano International Model-Building Competition—the greatest and most important ever organised by Meccano Ltd.—closed for entries on 31st March, and the judges will soon be commencing their formidable task of examining the thousands of entries and deciding the prizewinners. During the last weeks preceding the closing date, each mail brought heaps of entries. They came from model-builders of all ages, and among them were many that had travelled thousands of miles by sea or by air to reach our Offices in Binns Road. We can assure competitors who are now anxiously awaiting the results of their efforts that no time will be lost in announcing the names of those who prove successful.

Every prizewinner will be notified personally by letter, and the full lists of prizewinners will be announced as soon as possible in the *M.M.*



A good example of an architectural subject reproduced in Meccano. It represents the Entrance to the British Pavilion at the Brussels Exhibition in 1935, and was built by J. Willems, Antwerp.

are offered for Meccano models of subjects connected in any way, even remotely, with the Coronation Ceremony or the public celebrations. Examples of suitable subjects are St. Edward's Crown, which is used in the actual crowning ceremony, the State Throne, the Coronation Chair, and the State Coach in which the Queen will travel from the Palace to Westminster Abbey on Coronation day. There are other special coaches and carriages that will make good subjects, and some of the decorative emblems, coats of arms and other devices used for decorating streets and public buildings will be found suitable and attractive.

Model-builders with plenty of parts at their disposal can also tackle architectural subjects such as Buckingham Palace, Westminster Abbey and Admiralty Arch, through which the Coronation procession



Club and Branch News



WITH THE SECRETARY

LOOKING BACK—AND FORWARD

I am writing on a dull day in February, when Spring seems a long way off and indoor activities are still very congenial. But by the time these notes appear in print Clubs and Branches will be on the threshold of the first of the outdoor seasons. April is something of a dual month, a period of active embarkation on the open air programme, but at the same time one in which there may be days suitable only for indoor occupation.

So Club room days may still be with us. They can be put to good use in clearing up after the work of the Winter, and while doing this we can review the past, noting in what respects the programme has been successful, and where it has failed to come up to expectations. This stocktaking yields valuable guidance for future developments, just as the results of past Summer programmes provide a working basis on which to build up a popular schedule for the Summer session just beginning. Now is the time to plan this, and to begin a savings club, if this has not already been done, to provide for the expenses of excursions.

PROPOSED BRANCH

PORTOBELLO—Mr. G. Thomson, 78, Bingham Circle, Southfield, Portobello, Midlothian.

CLUB NOTES

ST. GEORGES (GATESHEAD) M.C.—A points system has been introduced in accordance with which medallions are to be awarded. This system has greatly increased enthusiasm at Model-building Competition meetings. In addition to Model-building, a Spelling "B," Quiz and Story-telling Evening, and Film Shows have been enjoyed. Club roll: 14. *Secretary:* A. H. England, 18, Joicey Road, Low Fell, Gateshead 9, Co. Durham.

COPDOCK (IPSWICH) M.C.—A member's prizewinning model in one of the fortnightly Model-building Competitions was a ship almost 6 ft. long. In a recent football match against Bramford the Club won 9-0. Club roll: 12. *Secretary:* K. E. Whitten, The Street, Copdock, Nr. Ipswich.

CRYPT GRAMMAR SCHOOL (GLOUCESTER) M.C.—The subject of a recent Model-building Competition was Cranes, and some excellent models were built. A general contest also resulted in some fine entries. Club roll: 43. *Secretary:* P. T. G. Hobbs, 31, Estcourt Road, Gloucester.

HORNSEA M.C.—There has been a marked increase in attendance. The varied subjects dealt with during a recent Debates Evening included the New Hornsea pier and out-of-school activities. Club roll: 11. *Secretary:* D. M. Stevenson, 29, Southgate Gardens, Hornsea, E. Yorks.

AUSTRALIA

FREMANTLE AND DISTRICT M.C.—An Exhibition of Meccano models staged by the Club at the Fremantle Town Hall was

a great success. The first prize was won by George Shea, with a fine block-setting crane. At a recent Parents and Visitors' Night sound films were shown by Mr. M. Finlayson. Club roll: 22. *Secretary:* B. A. Howe, 9, Phipps Street, Bicton, Western Australia.

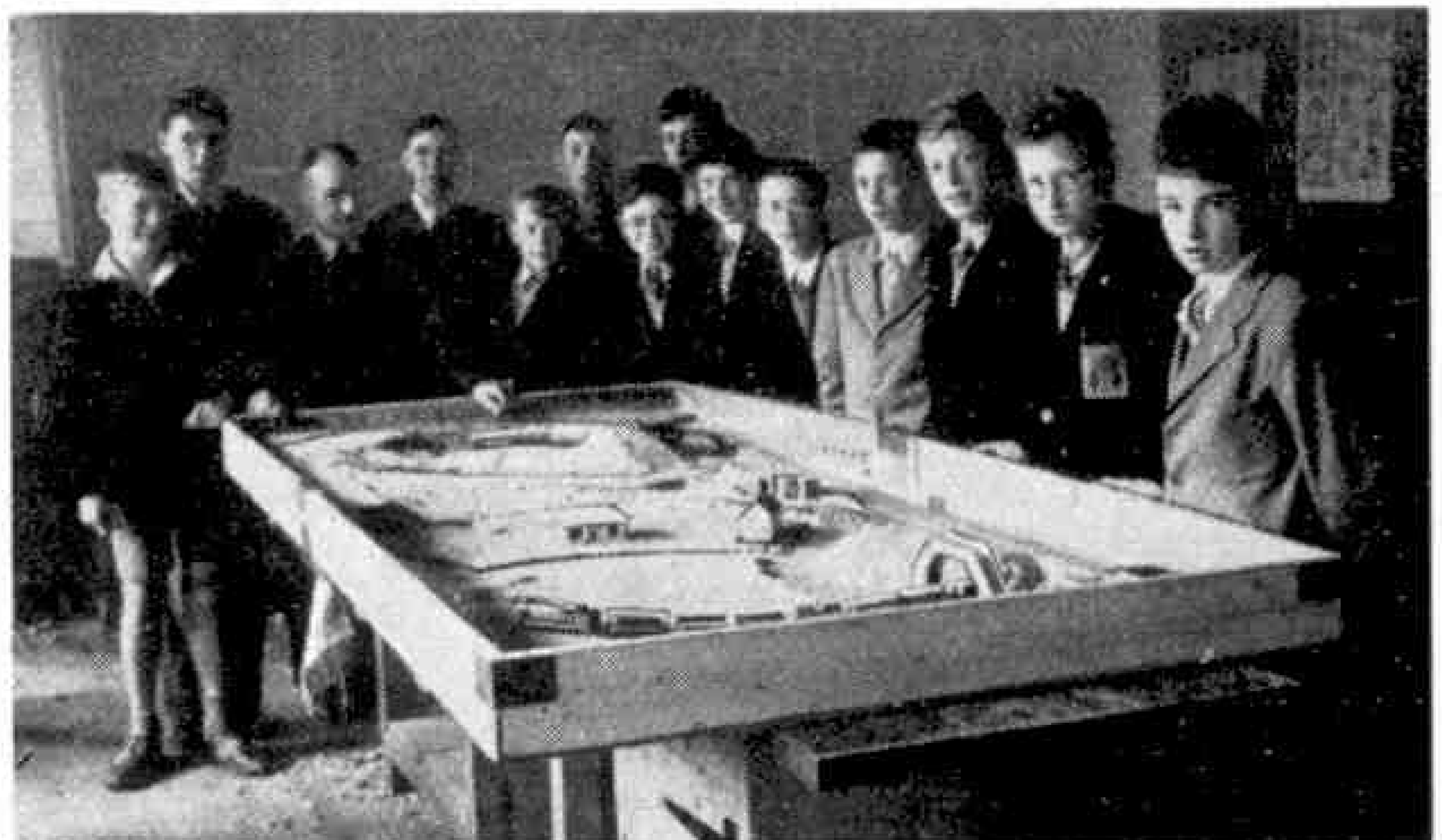
MAYLANDS M.C.—A most interesting illustrated Talk on *Whales and Whale-spotting* has been given by Mr. Pekin, who spots whales for the North West Whaling Company, at Point Cloates, and who uses an Auster aircraft for the job. Club roll: 34. *Secretary:* I. Davies, 40, Tenth Avenue, Maylands, Western Australia.

BRANCH NEWS

SULLIVAN UPPER SCHOOL (BELFAST)—Good progress has been made with the construction of a Dublo model layout of the Ulster Transport Authority's line from Belfast to Holywood. In connection with this work a visit was paid to the Belfast terminus of B. & C.D.R., now under U.T.A. control, where the main parts of locomotives were explained to members, and everyone had a chance to be on the footplate of either a 2-6-4 or a 0-6-2 tank engine. Members were also shown over the new diesel locomotives. *Secretary:* D. E. McCaskey, 18, Clara Park, Neills Hill, Belfast.

HINDHEAD AND DISTRICT—Several meetings were devoted to the laying and wiring of track and preparations of scenery for the Branch Exhibition, which was very successful. The first meeting after the Exhibition was devoted to a discussion of this important event. *Secretary:* B. A. Hinde, "Hindhead Brae," Hindhead, Surrey.

WATERLOO (DUBLIN)—Operation of the large Branch layout, representing the County Donegal Railways, has continued in spite of a change of site. The line is divided into sections with three separate control panels covering different stations. Special arrangements allow two, or all three, of the control boards to be worked together from a single panel according to the number of operators available, while all panels can be worked independently if required. *Secretary:* Mr. S. J. Carse, 38, Oakley Road, Ranelagh, Dublin, Irish Republic.



Officials and members of the Eastwood Secondary School (Glasgow) M.C. This progressive Club was affiliated with the Meccano Guild in November 1950, and carries out a well-varied programme that includes model-building, visits to local places of interest, and the operation of the extensive Hornby Dublo layout shown in this photograph.

HORNBY RAILWAY COMPANY

By the Secretary

British Railways Colours for Hornby-Dublo Trains

BY the time that you read these notes I expect that most of you will have seen some of the Hornby-Dublo Trains that are now available in the colours of British Railways. This important change from the liveries hitherto standard has been long awaited by all enthusiasts, and I am sure that when you see the models you will feel that your patience has been well rewarded.

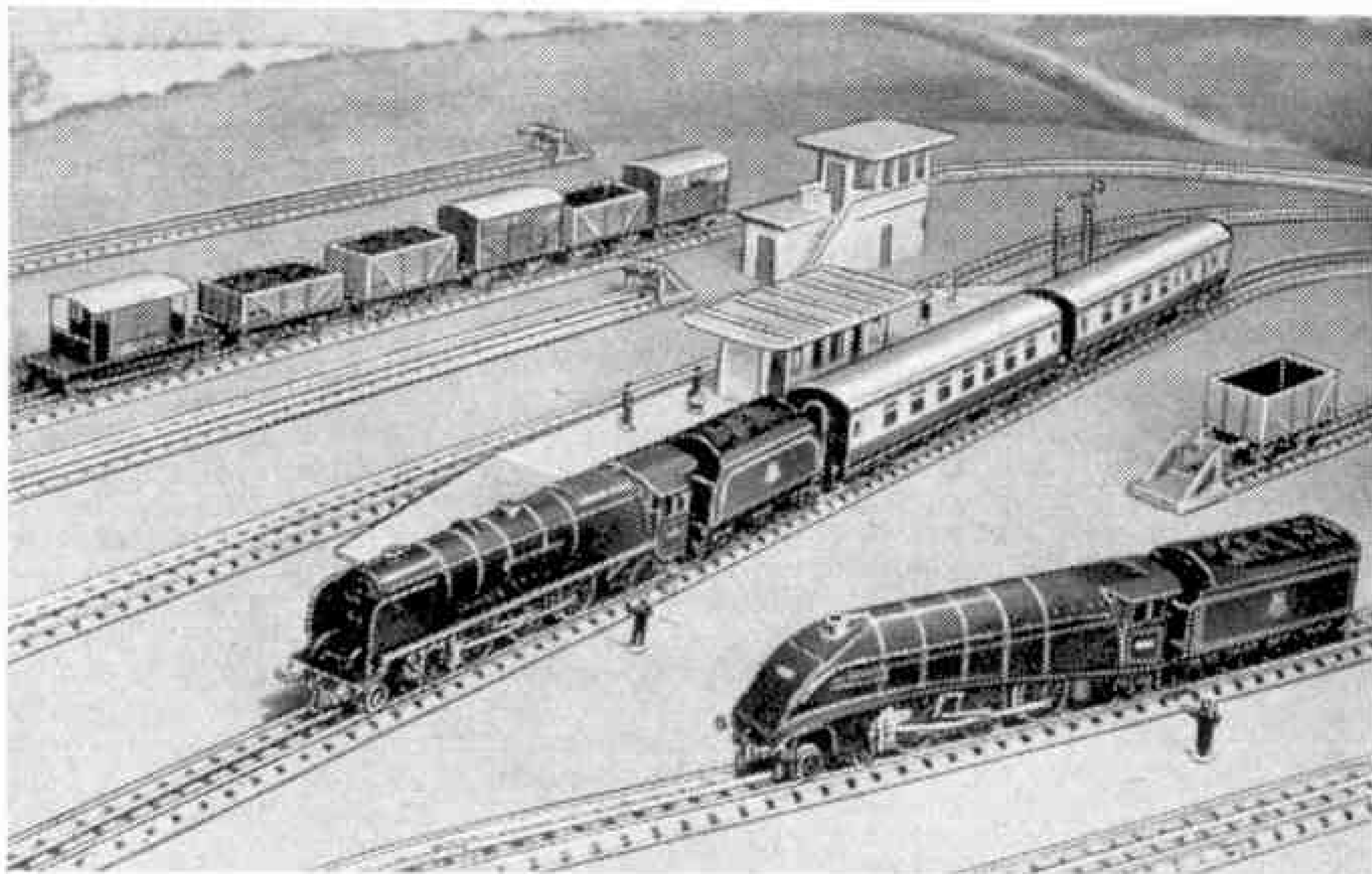
Apart from the change in livery the identities of the engines have been changed, so that there can be no confusion between the models formerly available in pre-nationalisation colours and those now in production. Thus the former L.N.E.R. streamlined locomotive in British Railways colours now available is the Eastern Region EDL11 *Silver King*, and the corresponding L.M.S. engine is EDL12 *Duchess of Montrose*.

There will be a real welcome for the *Silver King* Locomotive and its Tender, and the Train Sets including this engine and its characteristic Eastern Region Coaches will come along shortly. The new *Duchess of Montrose* Train Set complete is already available, with its green Locomotive and Tender, and typical coaches of the region in the striking crimson and cream uniform adapted for B.R. corridor stock. I need not tell you how extremely attractive these look, and the *Silver King* and its Tender are no less impressive.

A new development of considerable interest that affects both these 4-6-2 engines is that the appropriate lining out is now applied to them. So the black bands and orange lines standard for B.R. green-painted engines pick out the boiler bands, and the cab and tender sides. This seems to give additional "character"

to the models. In shape and detail Hornby-Dublo engines have always been first class, of course, but the new finish emphasises their quality in a remarkable manner. They will quickly become established as general favourites.

With the change of livery the opportunity has been taken to provide the *Duchess of Montrose* with the smoke-deflector plates that are characteristic of the real engines of this class. Although many do not like these "blinkers," their addition in this instance improves the already imposing appearance of the engine. Another front



This illustration shows well how striking in appearance are the Hornby-Dublo *Duchess of Montrose* train and the *Silver King* locomotive in their British Railways livery.

end detail, this time on the streamlined EDL11 *Silver King*, is the raised number plate on the sloping smoke-box front.

The Tenders of both the Hornby-Dublo 4-6-2 engines have gained considerably in the change to B.R. livery. The sides of their tanks are correctly lined out and each displays the characteristic "Lion and Wheel" emblem of British Railways.

The Coaches as now included in the *Duchess of Montrose* Train Set gain considerably in appearance in the new livery. The two-colour finish, with its cream panels at window level, is fresh and attractive. British Railways style of finish is also being applied to the Hornby-Dublo Tank Locomotive, which will become black with lining, and goods rolling stock.

The Ingrebourne Valley Line

THE Ingrebourne Valley line is not one of those branch line railways that are threatened with suspension of all services! On the contrary, it is a flourishing concern, laid with Hornby Gauge 0 rails that run from *Hornminster* to *Sandy Bay*. The latter is the station for *Much Paddling* which, so the General Manager tells us, is a small seaside place on the Essex coast at the mouth of the *River Ingrebourne*. It is famous for yachting and now for a Holiday Camp recently opened there! The General Manager in this instance is Mr. F. C. Spence of Hornchurch, Essex, a Hornby enthusiast of long experience who is an able guide for his young son Francis in the ways of railways large and small. So there has developed the system shown in the plan on this page, with its imaginary but well-thought out situation and local conditions. This topography accounts for the train services that run with great success on this clockwork-operated system.

In actual fact the railway is formed of a continuous oval main line, *Hornminster* being the main line station, with *Sandy Bay* situated on a long branch that runs round three sides of the main oval. The connection between the branch line and the main line is known as *Table-Leg Junction*. This gives a clue to its actual location, and the title duly appears on the signal box at the platform end.

As is sometimes convenient on a system of this kind, main line running is made in a clockwise direction only. This is certainly a point on a railway where spring-driven engines are used. These need winding at intervals and this operation is more easily performed if the engines keep the same way round, that is with the key shaft towards the operator.

Further information about the railway is that *Hornminster* is a small country town served by trains from Liverpool Street, Colchester and Southend on a part of the former L.N.E.R., now Eastern Region. Passenger services are provided

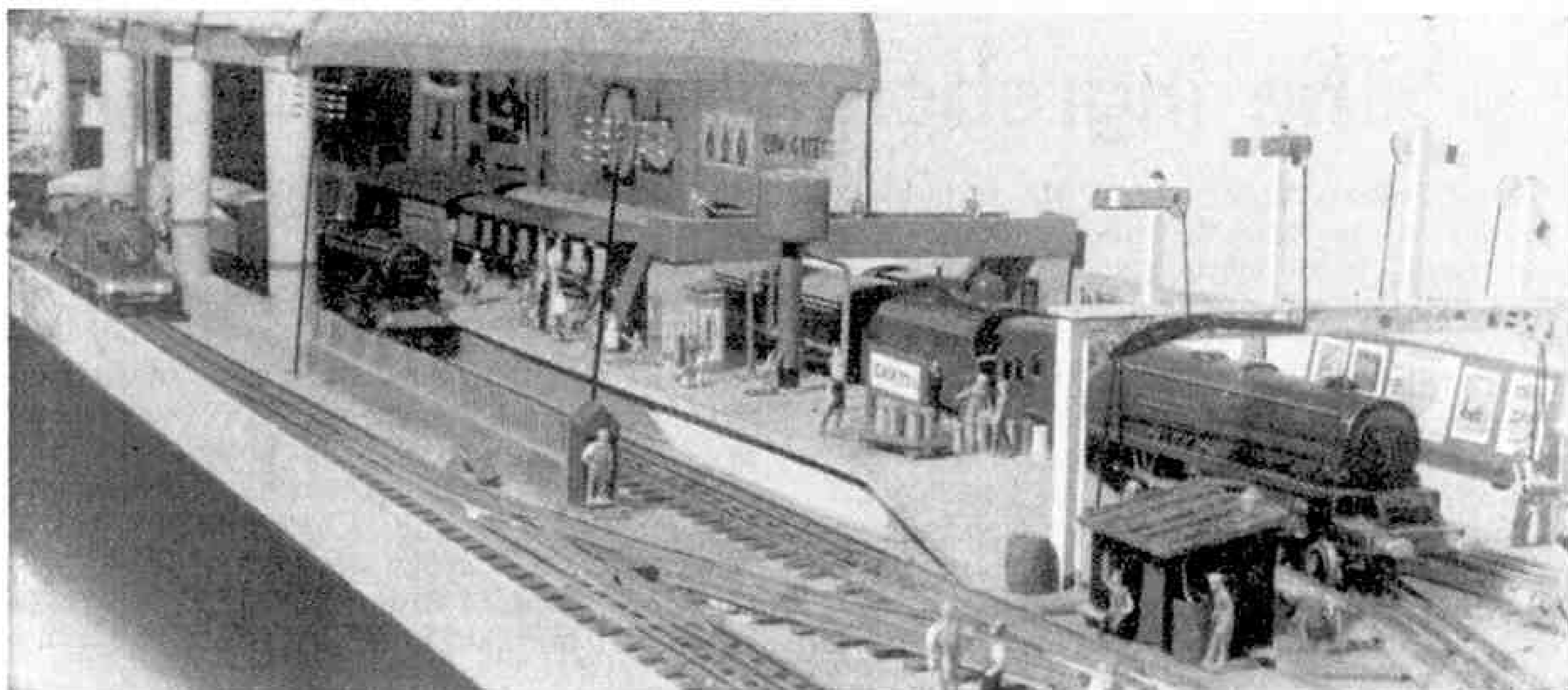
by a Hornby 101 Tank Locomotive with a set of No. 1 Coaches. There is plenty of goods traffic on the line that is catered for by the usual selection of Hornby Wagons and Vans.

A specially interesting traffic feature is that vans conveyed by main line trains are worked down to *Sandy Bay* and back again, the transfer operations involved at *Hornminster* forming a realistic piece of miniature railway station working. The through traffic thus conveyed consists largely of perishable stores for the Holiday



Camp, and so a Refrigerator Van is frequently used. This travels in the rear of the main line trains and so is simply detached when required at *Hornminster* platform.

Until recently some of the longer-distance trains ran through via *Hornminster* to *Sandy Bay*. This through running has now ceased and the section between *Hornminster* and the coast is worked by what is, literally, a push-pull unit. This consists of a bogie coach and motive power is provided by an engine specially constructed at home to fit on the rails, but without a mechanism, so that the young "driver," Francis, can push it along the track. Arrangements at *Sandy Bay* do not include a running round road so that there is good reason for using the push-pull method of working, for with this type of unit there is of course no running round to be done.



A Loop in a Tunnel

Terminal Working on an Unusual Layout

NOT many Hornby-Dublo layouts manage to include a large terminal station owing to the restrictions of space that always beset the miniature railway engineer. The illustrations on this and the following page are therefore of special interest as they show a layout on which really worth-while terminal accommodation has been provided in an ingenious way.

This system has been built up by Mr. C. S. Gerrish of Orpington, who has taken the fullest advantage of the possibilities offered by the space at his disposal. His railway is a permanent installation on baseboards. Its basis is the continuous oval main line, which has two tracks throughout and long straight stretches that provide splendid opportunities for fast, long-distance runs. As with the layout of Mr. R. E. Reeves, of which a plan was given in these pages last month, development of the railway has taken place outside the main track rather than inside it, as is so often necessary. But the two systems differ from one another in their arrangements for getting trains that have started from the terminus back into it again, after carrying out prescribed journeys on the main line.

This matter of providing for arrivals and departures raises quite a few problems on a miniature layout. Few systems can include two terminal stations of reasonable dimensions that would permit the operation

of point-to-point train services via the main line. Thus if a feature is made of one terminus only, with correct arrival and departure platforms, engine or carriage sidings and so on, it is essential to provide a formation that will allow for the trains returning to their original starting point.

It is easily possible for readers to follow how things are managed on the layout we describe, from the diagram on the opposite page. In the right hand bottom corner outside the main line is a more or

less circular track that is looped off the outer main line by means of Points. The bulk of this little section and a short part of the main line is carried through a tunnel, which accounts for the broken lines used to indicate this section in the diagram. Actually there are Points in this tunnel so that the fact

that the circular loop turns back again into the main line is concealed from the onlooker—or from curious passengers in trains passing on the other track!

The two-track main line is not used in the orthodox manner for up and down trains, but each track, or at least a section of it, may be run over by trains in either direction. This gives plenty of scope to the operator and of course each of these two main tracks has its own separate Hornby-Dublo Transformer and Controller. There are four sets of Points, forming two crossovers that connect the two tracks. In the centre rail connections between

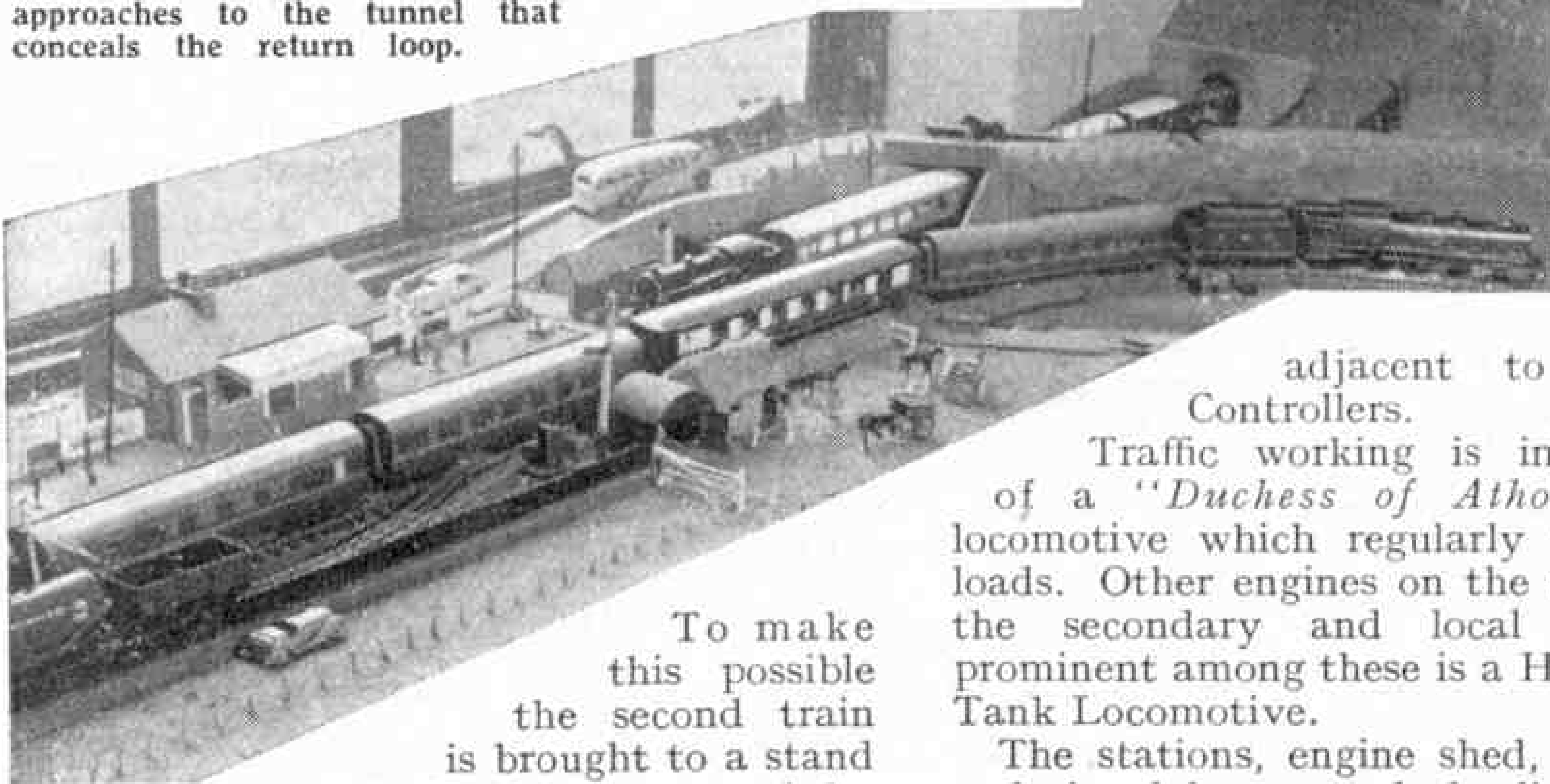
The illustration above shows the outer end of the terminal station on the Hornby-Dublo layout of Mr. C. S. Gerrish, Orpington. There is plenty of bustle on the platform while "Duchess of Atholl" prepares to leave with a heavy train.

each of the individual Points forming the crossovers there is an insulating gap arranged by means of the now familiar Insulating Tabs. In addition, Isolating Rails controlled by Switches are located at strategic points on the main line as well as in the sidings and terminal station platform lines.

With these arrangements the normal method of working is to prepare a train and run it out of the terminus on to the outer track. There it can make as many circuits as necessary; then, when required, after passing the wayside station it is sent forward over the circular loop. In this way it rejoins the main track that it has just left and goes forward on this until it is diverted to the inner main line by means of crossover Points near to the terminus junction. Once this train passes to the inner track another train can be brought into operation from the terminus on to the outer main line.

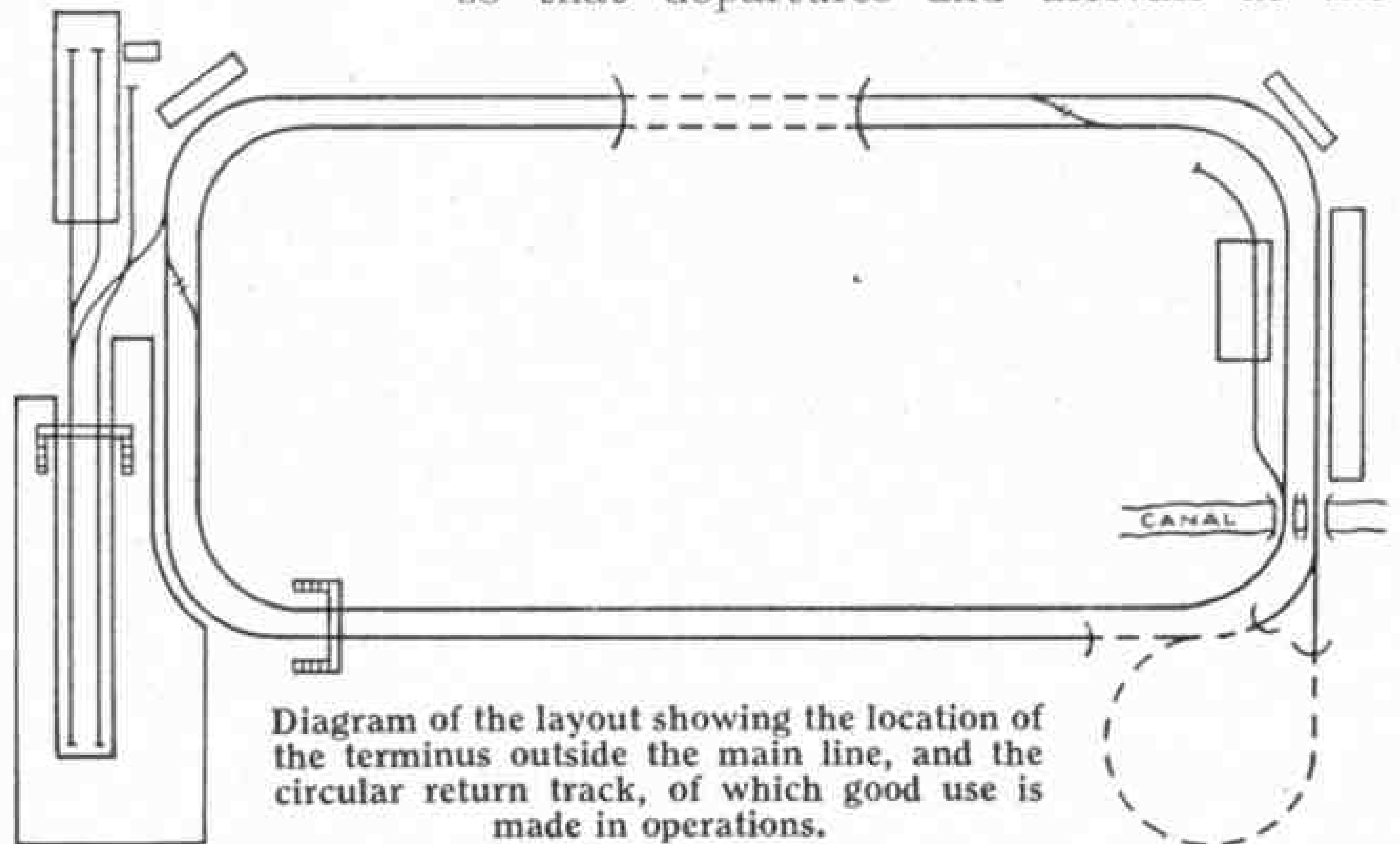
By this time, probably, the first train may be considered ready to reach its destination, or in other words to go back to the terminus where it began its run.

An interesting view showing the approaches to the tunnel that conceals the return loop.



To make this possible the second train is brought to a stand at the station served by the outer track. Here it is in a section extending from the crossover Points in the rear of it to the Canal Bridge ahead, and this section is then isolated. This permits the original train to use these

crossover Points to regain the outer track and then to be diverted into a suitable platform road at the terminal. Operations can then carry on through a further cycle. Plenty of variation is possible so that departures and arrivals at the



terminal can be arranged in an interesting manner.

Operations on the system are directed from the main control point which is situated inside the curved main track beyond the outer end of the terminus. Points are hand operated, with the exception of those connected with the return loop and the single set of Points

by the Canal Bridge. These are of the Electrically-Operated kind controlled from Switches

adjacent to the main Controllers.

Traffic working is in the hands of a "*Duchess of Atholl*" express locomotive which regularly takes heavy loads. Other engines on the system share the secondary and local duties and prominent among these is a Hornby-Dublo Tank Locomotive.

The stations, engine shed, goods depot and signal boxes, and the lineside effects that are outside the railway property have been constructed at home. The terminus station, engine shed and yard have electric lighting, current being obtained from a battery supply.

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Stamp Collectors' Corner

By F. E. Metcalfe

THE RED CROSS

WHEN Canada issued its very beautiful "Red Cross" stamp, in July 1952, to commemorate the holding of the 18th International Red Cross Congress at Toronto, dealers were astounded by the number of these stamps they sold. It became evident that few subjects were more popular with thematic or topical collectors, as they are called in America. Many Meccano readers also will be interested in these Red Cross stamps, and will welcome some details suitable for use in writing up their collections.

It might be thought by some who have not given these Red Cross stamps much attention that a collection would only comprise a handful of stamps. Those who have thought on those lines are going to get a shock, for over a hundred stamp issuing countries have honoured the Red Cross, and they have produced over three hundred stamps in the process.

Portugal had the distinction of being the first of those hundred to set the new fashion, and that as long ago as 1889. A set of franchise stamps was the beginning, but if Portugal was the first in the field, Spain and her colonies hold the record for quantity, for believe it or not, 147 Red Cross stamps have been issued by the Spanish postal authorities; at least they have been credited with that number, but it must be admitted, that while beautiful designs were concerned—they were printed by the British firm of Waterlows—the stamps were subjects of a good deal of speculation and they are not thought very highly of by philatelists. They make a fine show in a thematic collection, however, and the fact that they are easily obtainable and fairly cheap is to their advantage.

Of all the Red Cross issues perhaps the one that is of most interest to British collectors is a stamp that forms part of a set issued by Belgium in 1939 to commemorate the 75th Anniversary of the International

Red Cross Society. This is the 30c. value, which shows a good portrait of our own Florence Nightingale. It is a pity that this stamp had not been line engraved, instead of photogravure; then indeed we should have had one of the most beautiful stamps ever designed. In the same set we get another very striking stamp, showing Queen Elizabeth of Belgium talking to a wounded soldier.

This design really had to do with the first World War, and it was this terrible event that brought the Red Cross into such prominence. In view of the resulting great need for funds, the large amount of money that collectors have spent on Red Cross stamps has done an immense amount of good, so if a little more

has been spent on such things than one feels justified in spending on a hobby, one has the satisfaction of knowing that it is all in a good cause.

I have mentioned the set that Belgium issued in 1939 to commemorate the 75th Anniversary of the International Society. Several other countries also

honoured the same event, but when we consider how many countries issued sets of stamps for the 75th Anniversary of the Postal Union, now that the various postal authorities have become wise to the money to be earned with stamps, there will no doubt be hundreds of issues when the Red Cross centenary comes along.

I mentioned that Spain and her colonies had produced the largest number of Red Cross stamps. Another country that also has been very

prolific is Finland, and among the stamps of this country are some of the most beautiful. Turkey has been a good runner, and of course France has been well to the fore, and probably has produced more funds thereby than any other country.

Countries that have produced Red Cross stamps include the U.S.A., Costa Rica, Haiti, Hungary, Iceland, Japan, Norway, etc. Not all the so-called Red Cross stamps are exactly postal issues, but they are all included in thematic collections. There are also side-line collections, that is collections of special subjects, connected with the Red Cross, such as stamps with designs incorporating nurses. This is a very popular branch and many countries are concerned.

From all this it can be seen what a wide selection of stamps there is to pick from. Moreover, many countries are concerned and whether you collect European stamps, South American, or any other group you favour, one or two "Red Cross" stamps will come into the picture. I think all will agree in consequence that it is a pity Great Britain is one of the few countries missing from the list.

The U.S.A. is the latest country to honour the Red Cross, and she has done it with a really beautifully designed stamp issued on 21st November. Comparisons with the Canadian stamp issued July 1952 are bound to be made, as the two are rather similar, and if the American effort is not

considered quite as handsome as that of Canada, this does not mean that the U.S.A. has not done the Red Cross proud. The accom-

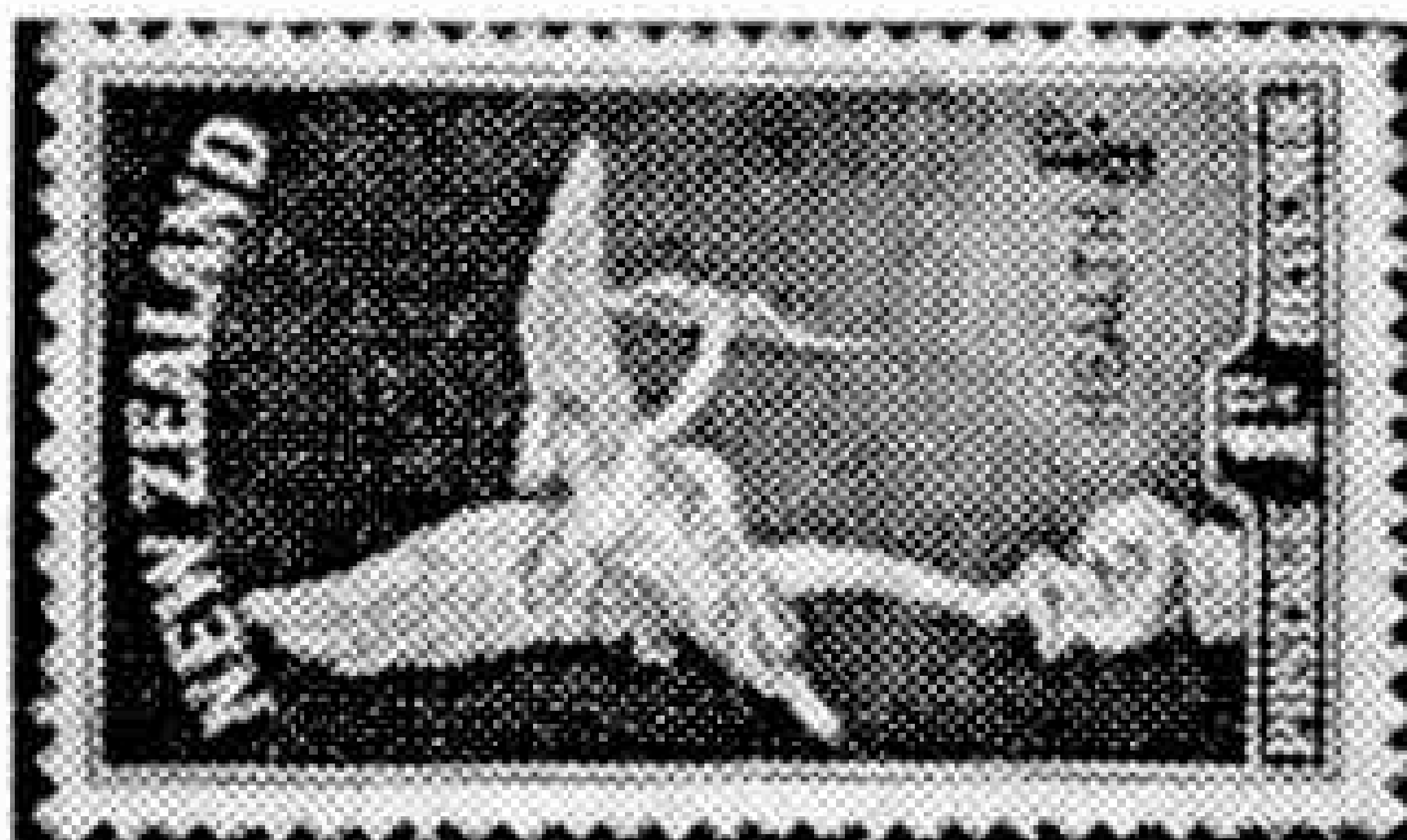
panying illustration of the stamp is a proof that this is not the case.

A portrait of Florence Nightingale is to be found on a stamp issued by Costa Rica. It is interesting to note that Nurse Edith Cavell figures on the same stamp. A graceful tribute to two great British women.

If you feel like forming one of these Red Cross collections, don't be afraid that you will need to spend a lot of money, for many of the stamps are quite cheap. But I am afraid that pending the publication of a special catalogue, which no doubt will come in time, a Gibbon's Simplified will be needed to trace them. One up to date will cost nearly a pound, but one not quite so new will be much cheaper.



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Stamp Gossip

TOTEM POLES

WHEN Canada issued its "Fish" stamp in 1951, this met with quite a lot of criticism. You know the stamp I mean—the 1 dollar value with all those fishes round the frame, Commonwealth No. 56. Whatever then will people say about the 1 dollar stamp issued 2nd February? I think that they will agree that the actual stamp looks a lot better than the photograph, and no one can deny that the design is full of interest.

The Canadian Post Office have kindly supplied me with full details of this stamp. They say "The design shows a Pacific Coast Indian House and Totem Pole, and this was selected for reproduction because it represents a very popular symbol of a colourful chapter of Canada's rich heritage. The natives of the north-west coast of Canada were accustomed to record for posterity their genealogy, history and traditions by carving and painting, using representative symbols, chiefly animal designs. The subject of the new postage stamp emphasises the great degree of skill and imagination the Indians displayed in their artistic expressions."



From all this it will be seen what an interesting stamp Canada has given us. Perhaps a mint copy, with the face value of over 7/-, will be beyond the pocket of the young collector, who will surely want one. Never mind, have a little patience, and a nice used one should be available from your favourite dealer for a couple of shillings at the outside. But don't rush to buy, if you want one at that price.

PROVISIONALS

Some time ago a youthful collector asked me what a "provisional" stamp was. I could only reply that it was a stamp being used as a stop-gap. Now I am able to illustrate one of the latest of these varieties, from New Zealand. As it is an overprinted stamp, it may not be very popular, but some collectors make special collections of these "provisionals," for there is generally a story about their origin, and such a collection, well written up, will interest the non-collector as well as the philatelist.

A change in postal rates made this 3d. New Zealand provisional a necessity. After 1st January letters for inland destinations and the British Empire cost 3d. to send, and this meant a run on 3d. stamps. There were not enough to take care of the increased demand, so 1d. stamps were surcharged—and there you are.

As soon as additional supplies of 3d. stamps are received from G.B. the "provisionals" will be withdrawn, which means that by the time these words are



in print the stamps will be obsolete. But I don't suppose they will be very hard to get hold of. It should be mentioned that this change in postal rates has meant an alteration also in the stamps to be issued for the Coronation, and the designs of the 2d. and 3d. values have been transposed.



WITH OR WITHOUT

Some Meccano readers would no doubt read in the newspapers about the trouble there was in Belgium over new stamps showing a portrait of the present King. Our own country also has had its spot of controversy, which all goes to show how seriously stamp designs are taken these days.

The trouble in Belgium had to do with whether the King should be shown wearing glasses, which he does normally, or not. The notes won, and out came the stamps, one of which is illustrated.

But that was far from the end of the trouble, for the two sides then joined hands and demanded that the stamps should be withdrawn. This was done in three days, for the engraving had been too lifelike, and the portrait showed one who was obviously used to glasses, for the eyes seemed weak. Although the stamps had a very short life, they will not be very scarce, and collectors will have little difficulty in obtaining copies of an issue that disturbed a whole nation.

MILITARY MEDAL

Of the many stamps I would have liked to illustrate this month, I have picked the commemorative, one for each colony, which France is issuing to commemorate the centenary of the Medaille Militaire created in 1852 by Napoleon III. Not all the stamps are alike, but they will not be hard to obtain, and collectors can have a lot of fun picking them up in singles.

Some of our own soldiers are or have been proud possessors of the medals. The late Field Marshal Lord French was a notable example. Actually the medal is not now of the same design as when it was first issued, for in 1870 the head of Ceres was substituted for that of the late Emperor.

COLOUR GUIDES

A reader who collects KG VI and QE II stamps, and, as usual, is very interested in shades tells me that he is now arranging his collection according to the Commonwealth Catalogue, and he is having a lot of enjoyment in the process. That is what stamp collecting is for, but he is very anxious to make sure that he classifies correctly the shades given in the catalogue, and he wants to know if a colour guide is very useful for one such as he.

On the whole the answer is no, because whilst we have had many of these guides from time to time, their scope is far too limited. The best of them give less than a hundred colours and shades, while there are hundreds of shades amongst postage stamps.

As a matter of fact collectors of shades, once they have acquired a little practice, do not find their classification as difficult as one might imagine.



From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy

THE OLDEST JAPANESE LOCOMOTIVE

The accompanying illustration shows the oldest Japanese locomotive, now in the Tokyo Railway Museum. It is a 2-4-0 tank, Vulcan Foundry built, and carries the number "1" of the Japanese Government Railway. It began service in 1872, between Tokyo and Yokohama, on the first railway in the country.

British engineers surveyed and built almost all the important railways of Japan, and British officials and drivers were in control in their early days. The line from Tokyo to Yokohama was a branch of the first main line, which was planned to connect the capital with Kyoto and other important cities in the south. The gauge of 3 ft. 6 in. adopted for it became the standard gauge of Japanese railways.

On 12th September 1872 the locomotive illustrated hauled the Imperial train to commemorate the opening of the line. It was used for mixed traffic purposes, and later for shunting. In 1906, 17 Japanese railway companies were amalgamated, and included in the Government railway lines to form a country-wide nationalised railway system. Since then new locomotives required have been built in Japan. The Vulcan engine was withdrawn from active service in 1910, without any official report if it was sold to another company or scrapped.

Long years after, when it was decided to open a Railway Museum in Tokyo, investigations were made by railway authorities throughout the country to find old machines that were still in existence. Then it was found that this pioneer was still on service in

the Shimabara Railway Co., on the west coast of Kyushu Island. It made its appearance in the Museum in 1930.

The *Zenoji*, another British built 0-6-0T tank, the number 1 of the former Nippon Railway Co., and



Buckland Abbey, once the home of Sir Francis Drake. Photograph by R. Rowe, Shirley, Croydon.

the *Benkei*, the number 2 of the former Hokkaido Railway Co., a 2-6-0 locomotive built in U.S.A. in 1881, are also exhibited there.

YOSHIO ONO (Tokyo).

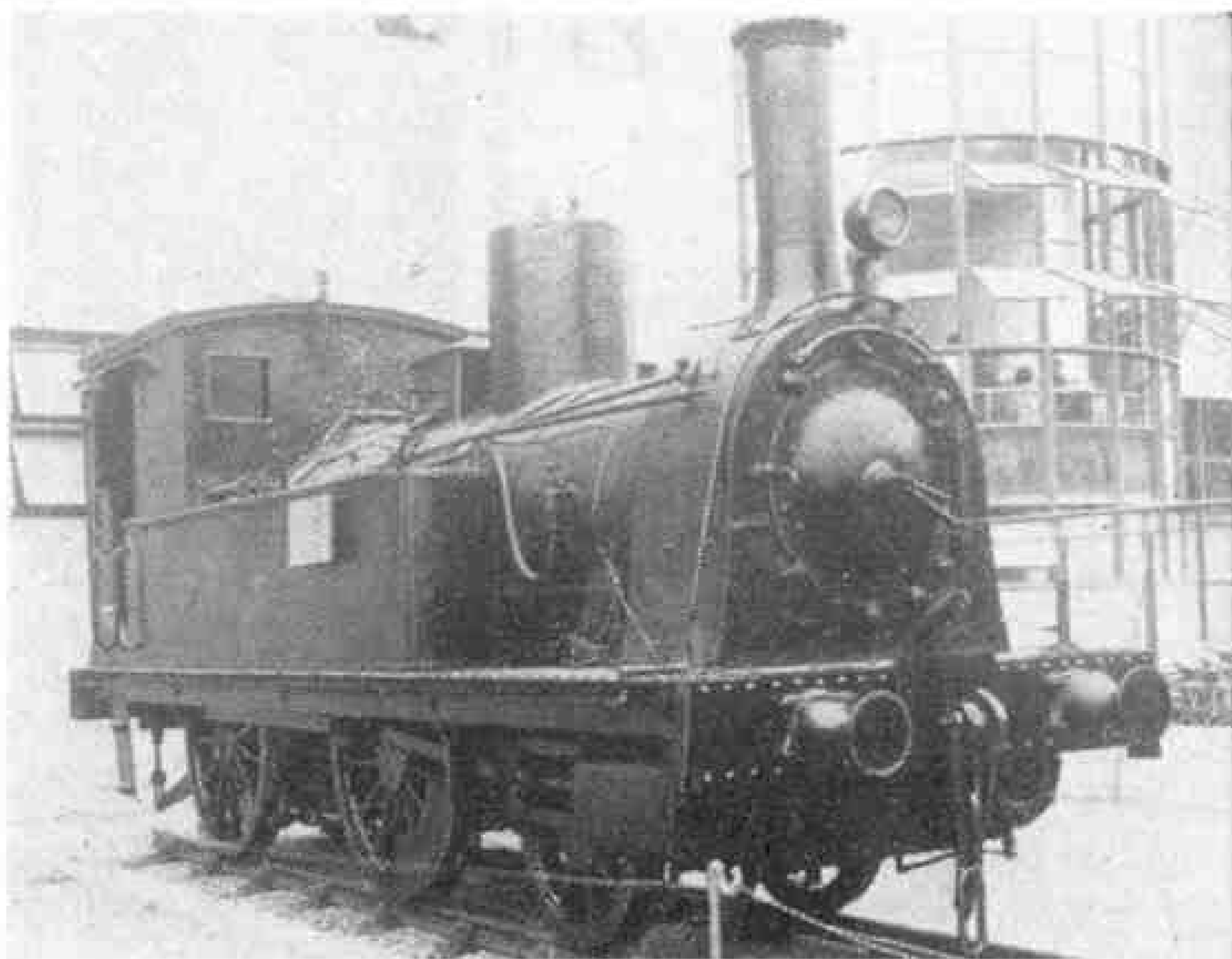
BUCKLAND ABBEY

Recently the National Trust have opened Buckland Abbey, once the home of Sir Francis Drake. Although the Abbey is now a museum it was once an Abbey, for in 1278 it was given to the monks by the Countess of Devon. It was not until the dissolution of the monasteries in 1539 that it was converted into a mansion. Fortunately the Abbey was not burned or destroyed.

The King, then Henry VIII, granted it to Sir Richard Grenville of Bideford for the sum of £233 3s. 4d. It is interesting to note the sums paid by Sir Richard Grenville and Sir Francis Drake bearing in mind of course that the pound was worth far more then than it is today. Sir Richard Grenville converted it into a mansion, and in 1581 it was sold to Sir Francis Drake for the sum of £3,400. From time to time some families have lived there, and it was not until a few years before the war that it was unoccupied. Unfortunately the West wing was completely gutted by fire in 1938, but it was rebuilt in the same year.

Now Buckland Abbey has been turned into a museum and it contains several things worthy of mention, including a portrait of Drake by Jansens, dated 1594. Drake's Drum is there also; but I think only for certain parts of the year.

R. ROWE (Shirley, Croydon).

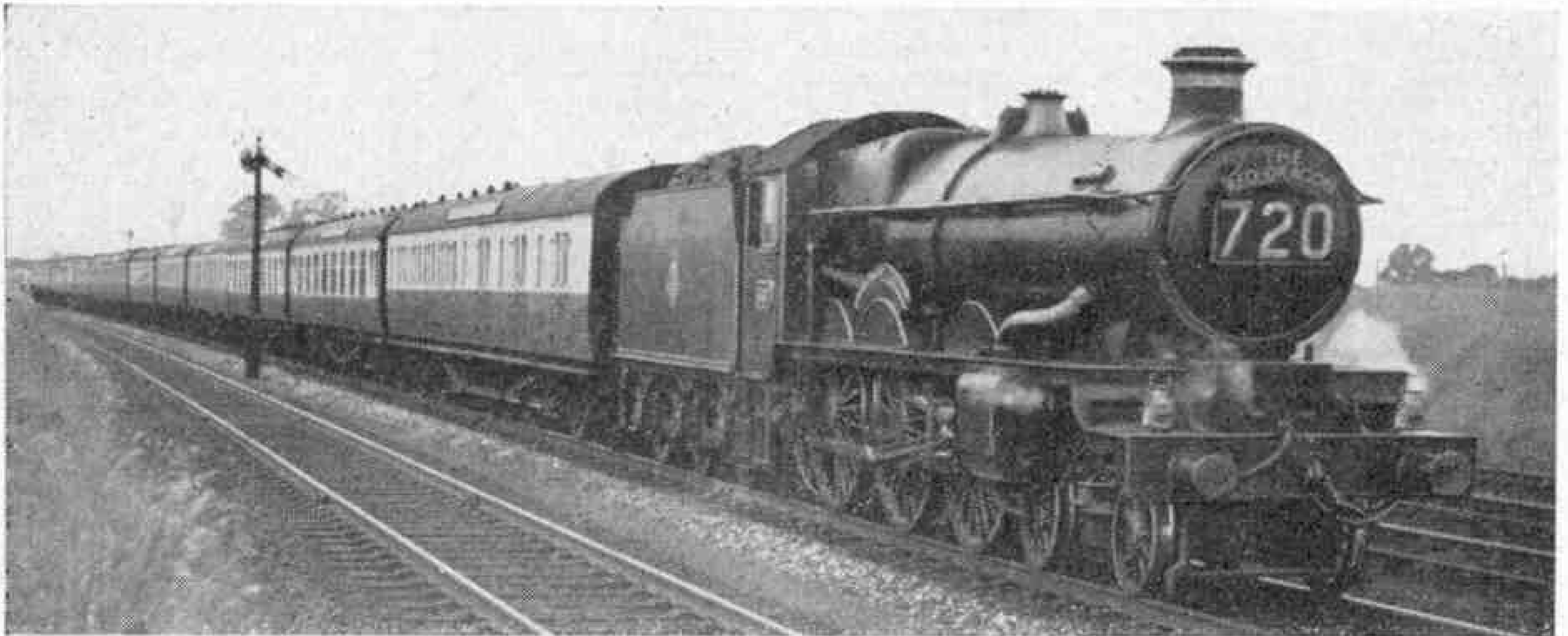


Japan's oldest locomotive, now in the Railway Museum, Tokyo. Photograph by Yoshio Ono, Tokyo.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Which Named Trains are These?



Titled trains are always interesting, and our competition this month is devoted to them. In it the names of ten trains are concealed in various clues. For instance, a clue such as *A national emblem all the year round* would refer obviously to the *Red Dragon* of the Western Region of British Railways, which is shown in the photograph by Mr. E. R. Wethersett reproduced on this page. There is another Dragon, but as this, *The Welsh Dragon*, runs in the summer only it does not fit in with the clue. Readers will find 10 similar clues below, and solving these should provide an interesting and pleasant task.

1. Provides tools in dining car?
2. Inland, obviously.
3. To France, but not while the sun is shining.
4. Not a flying saucer, although apparently in the heavens.
5. Rings electrically?
6. His quest is usually gold.
7. The President who defined democracy.
8. A Queen's train, although in the U.S.A.?
9. An unpleasant Mediterranean wind.
10. A football club has the same name.

When a competitor is satisfied that he has found all the names of the trains concerned he should write them on a sheet of paper in the order in which they appear in the competition. In addition the routes they take and the railways over which

they operate should be given. Only one side of the paper should be used. Each entry must bear the name, address and age of the competitor.

As usual, there will be two sections, for home and overseas readers respectively, and in each section prizes to the value of 21/-, 15/- and 10/6 will be awarded. There will be also a number of consolation prizes for deserving efforts. The judges will take neatness and originality into account when awarding prizes.

Envelopes containing entries should be addressed *Named Trains Competition, Meccano Magazine, Binns Road, Liverpool 13*. The closing dates for entries are, Home section, 30th May; Overseas Section, 31st August.

April Photographic Contest

The fourth of our 1953 series of photographic contests is a general one in which we invite readers to submit prints of any subject. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents, also his age must be given.

The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed: *April Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section, 30th April; Overseas Section, 31st July 1953.

Competitors who desire their entries to be returned should note the paragraph at the top of this page.

Mobile Cranes at Work—(Continued from page 177)

of duties and are a highly efficient engineering job.

The crane seen engaged in grabbing work on our cover, which is a reproduction of a painting by Terence Cuneo, is of the KL44 type. It is engaged on excavation work, for which it is provided with a grab that allows it to lift up earth and other material to be moved. This is readily deposited in lorries for removal by swinging the jib round and operating the mechanism that opens the grab, the movements of which are controlled by the crane operator.

In work of this kind the crane has to move about over rough and broken ground, in conditions often difficult for the movement of a wheeled vehicle. To meet such conditions the KL44 type can be mounted on crawler tracks, as in the crane seen on our cover. The KL66 crane can be mounted similarly.

With a Camera in the Midlands—

(Continued from page 192)

more shots on this length, I left after breakfast next morning, my intention being to use up the remainder of the plates at the troughs between Denham and Ruislip, where one again gets a joint G.W. and G.C. line. These troughs were, until comparatively recently, in more or less open country. As they are now at the rear of a new housing estate, I had some considerable difficulty in finding them at all, and after trespassing through the garden of a somewhat irate lady who eventually relented and gave me permission, I was able to get a few shots of G.W.R. Birmingham expresses and of a couple of goods hauled by "Austerity" 2-8-0s.

Having finished all my plates I scrambled back into the garden again across a deep and very slippery ditch and through another very flourishing bed of nettles, tearing my other pair of trousers on a projecting nail. This resulted in the dropping of my camera case into the bed of nettles and therefore I had to plunge my hand and arm into them in order to retrieve it, with a very good chance of slipping back into the ditch!

However, I managed to reach the car in conditions of comparative comfort and had a pleasant run home through Watford.

How Tennis Rackets are Made—

(Continued from page 203)

He ends with a touch of machine sand papering, and the racket is then ready for lacquering and polishing.

A perfect surface is necessary for these final operations. A filler is first applied to the wood, and the grain is again smoothed down with a fine abrasive paper. The parts not to be treated are then masked with paper, and lacquer is sprayed on. Next the crescent base is painted by hand, and strip decorations are added and the necessary transfers applied. Then the frame is ready for the final spraying with successive coats of transparent lacquer. This must be perfectly even, so a special electrostatic method of deposition of the lacquer is used. The frame is finally buffed to a high polish.

Stringing is the next stage in the production of a racket. For this selected sheep gut is used, and it is interesting to find that the gut from as many as five to seven sheep is needed to provide the strings for a single racket. The main strings are threaded by hand and tensioned on a machine, and the tension is maintained at every point by ingenious "locking" of the strings. The cross strings are tensioned by a mechanical winch on the stringing machine, which locks them at the correct stress to prevent over tensioning. The whole proceeding takes about half an hour. The thinner strings called "treblings" are threaded by hand across the main strings at the top and bottom of the body.

The string tension for the rackets of Wimbledon or

Davis Cup players is often as much as 75 lb., but for the rackets used by the average Club players 50 to 70 lb. is usual.

The strings are finally weather proofed by applying a special varnish by hand. The grip is then wrapped securely round the handle and the end piece is added. This completes the racket, which is then carefully checked for weight and balance before it is placed in the wrapping in which it reaches the enthusiast who is to play with it.

Meccano Special Model—(Continued from page 207)

2 of No. 9b; 2 of No. 9d; 2 of No. 9e; 2 of No. 9f; 20 of No. 10; 6 of No. 12; 4 of No. 12a; 4 of No. 12b; 6 of No. 12c; 2 of No. 13a; 3 of No. 14; 1 of No. 15; 6 of No. 15a; 2 of No. 15b; 4 of No. 16; 2 of No. 16a; 1 of No. 16b; 5 of No. 17; 9 of No. 18a; 2 of No. 18b; 6 of No. 20; 12 of No. 20b; 13 of No. 22; 7 of No. 22a; 2 of No. 23; 2 of No. 24; 1 of No. 24a; 1 of No. 25; 5 of No. 26; 2 of No. 26a; 1 of No. 27; 3 of No. 27a; 1 of No. 27b; 2 of No. 28; 2 of No. 30; 4 of No. 32; 6 of No. 35; 486 of No. 37; 40 of No. 37a; 147 of No. 38; 2 of No. 38d; 2 of No. 40; 2 of No. 43; 1 of No. 45; 1 of No. 46; 4 of No. 48; 4 of No. 48a; 3 of No. 48b; 6 of No. 52a; 3 of No. 53; 41 of No. 59; 7 of No. 63; 3 of No. 70; 6 of No. 90; 1 of No. 94; 1 of No. 95a; 2 of No. 96; 5 of No. 96a; 2 of No. 103g; 16 of No. 111; 3 of No. 111a; 12 of No. 111c; 2 of No. 120b; 8 of No. 126; 8 of No. 126a; 2 of No. 133a; 1 of No. 145; 2 of No. 144; 2 of No. 146; 2 of No. 155; 1 of No. 166; 4 of No. 179; 4 of No. 186b; 8 of No. 188; 6 of No. 189; 1 of No. 190; 2 of No. 191; 10 of No. 192; 1 of No. 196; 1 of No. 197; 2 of No. 200; 4 of No. 214; 1 E20R Electric Motor.

PINION FOR GEARED ROLLER BEARING

Owners of the pre-war Meccano Geared Roller Bearing (Part No. 167) may be interested to know that a few of the special 16-tooth Pinions (Part No. 167c), for use with the Geared Roller Bearing, are still available.

The Pinions can be used with standard Meccano Axle Rods, but cannot be meshed with any of the ordinary Meccano gears. Two of them can be used together to give a 1:1 ratio. Their diameter is $1\frac{1}{8}$ in. and face $\frac{1}{4}$ in. These parts have been withdrawn from the Meccano range, and no further supplies of the Roller Bearing itself are available.

Anyone requiring this special Pinion should take this opportunity of obtaining one, for no more will be available once the present small stock is sold. The Pinions can be obtained direct from Meccano Ltd., Binns Road, Liverpool 13, and the price is 2/6 each post free.

B.R.M. DISPLAY IN BIRMINGHAM

Readers living in the Birmingham area will find many attractions in the National Trades and Homelife Exhibition that opened in Bingley Hall, Birmingham, on 18th March and will remain open until 18th April. Included among the exhibits is an actual B.R.M. Racing Car, and films of the car during construction and racing are being shown. The Rubery, Owen film *For Every Vehicle* also can be seen, and a set of large coloured transparencies of the B.R.M. forms part of the display.

Mr. Raymond Mays is in attendance, with the well-known racing drivers Reg Parnell and Ken Wharton, and another attraction included in the B.R.M. exhibition is the Shell Petroleum Company Neoflo Display, depicting the latest catalytic Petroleum Cracker, the most up-to-date development in refining petrol.

Details of the B.R.M. Club are available on the stand, together with sets of post card size photographs of the B.R.M. and its drivers.

Fireside Fun

"Yes, my idea is to invent a machine that will write out all my homework for me when I press a button, just like one of those new electronic thinking machines."

"Good idea, but I can think of a grand improvement to make things easier still."

"You couldn't."

"Yes, I could. It would be a machine to press the button."

"Yes, the idle rich are to be envied."

"Oh, not always. I know men without any money at all who are just as lazy."

"Say, landlord, those folks in the flat above me came down and made a disgraceful row at my door at one o'clock this morning."

"Woke you up with it did they? I'll tell..."

"No, it doesn't matter. Luckily I was still up practising on my cornet."

"Yes, this flint arrowhead must be more than four thousand years old."

"Go away. It can't be. It's only 1953 now."

"Heavens! Call yourself a scout and you leave the liniment behind!"

"Well, it said on the bottle it wasn't to be taken."

First darkie: "Yaas. Las' night a ghost just walked in on me through de wall on dat side."

Second darkie: "Did it frighten you?"

First darkie: "I'll say it did. I jes' went slap through de wall on de other side."

"Say, that new man down the street does the listening for engines."

"Strange. What on earth do you mean?"

"He's an engineer, you see."

"I hope my saxophone practice doesn't disturb you."

"Well, it did at first when I heard the neighbours talking about you. But I don't care what happens to you now."

"Worse and worse. Last term you were last but one in class and now you're last."

"Well, dad, I can't help it if Johnny Green is ill, can I?"

"You must have gone through a lot when you began to drive your car."

"Oh not much. Just a hedge or two, a fence and the garage doors."

"A quire of paper? That must be a pianola roll."

BRAIN TEASERS CORRECT NAMING WANTED

A				
B				
C				
D				
E				

Look at the diagram alongside. It is a little odd, as two squares seem to be missing. That really has nothing to do with the puzzle, which is to put in the five rows five Christian names, the first three and the last those of girls and the fourth that of a boy, beginning respectively with the letters A, B, C, D and E. The names are to be chosen so that the letters in columns three and four give the names of yet another girl and boy respectively.

S.W.C.

PLENTY OF CHANGE WANTED

Suppose that you are liable to be called upon to pay any sum between $\frac{1}{4}$ d. and 6/-, the successive sums going up by $\frac{1}{4}$ d. at a time. What is the least number of coins you would require, and what would the coins be?

A ROUGH DIAMOND

		1		
	2			
3		■	4	
	5			
		6		

Another drawing full of little squares, in which the middle square is to be blacked out. Here are enough clues to allow the remaining squares to be filled in. Clues Across: 2, A gross affair; 3, A score more than a life's span; 4, Just a score here; 5, Starts to number off, but drops back to zero; 6, Adds up 5 across. Clue Down: 1, Just the end of the gross affair.

These clues are sufficient to complete the diamond. What with, you ask? With whatever fits the clues.

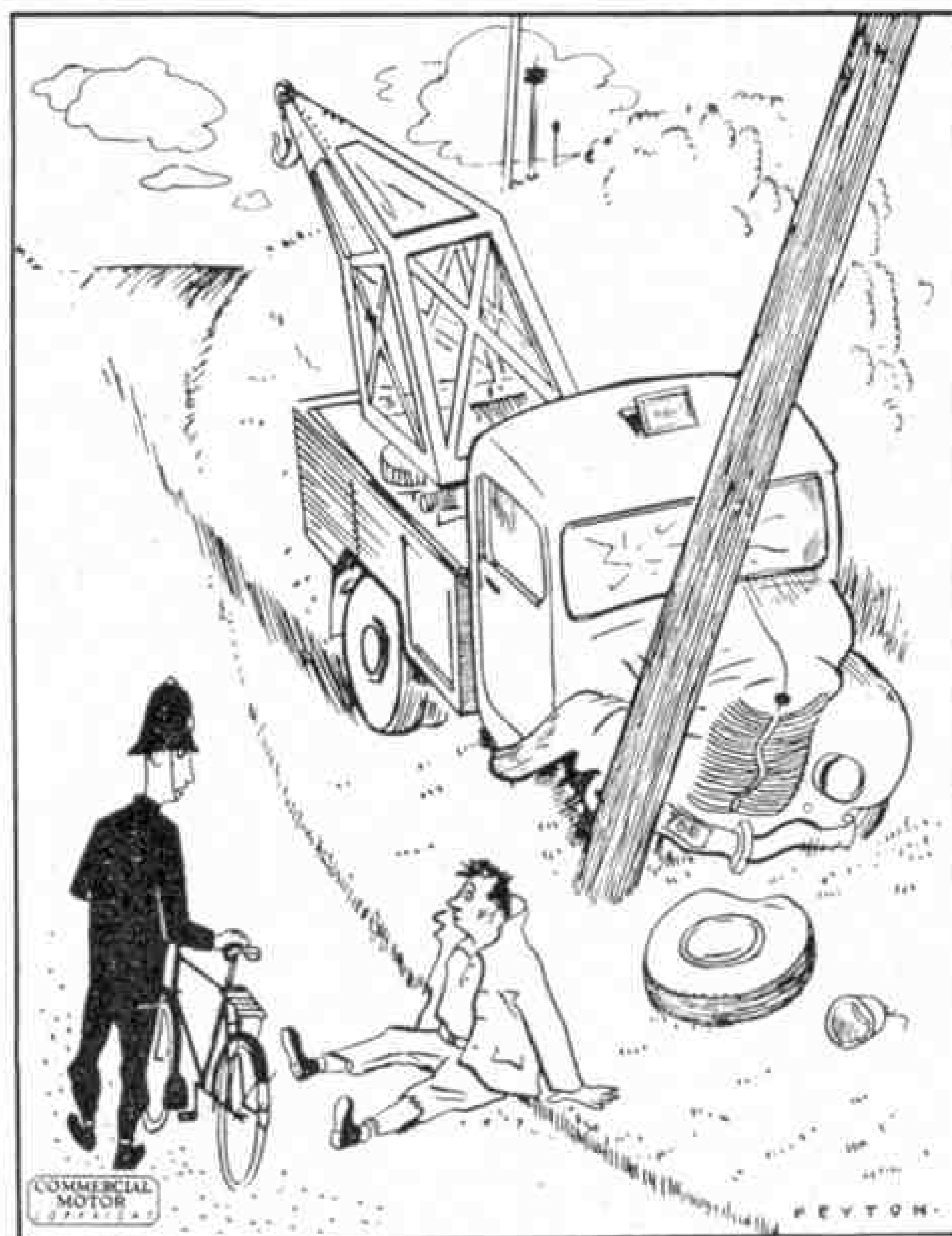
E.B.P.

SOLUTIONS TO LAST MONTH'S PUZZLES

The smallest square that can be inscribed in another has its corners half way along the sides of the larger containing square.

To solve our second puzzle fill the three quart container and pour its contents into the five-quart vessel. Fill the smaller container again, and from it fill up the larger one, leaving one quart in the smaller container. Empty the five quart vessel, and pour into it the one quart. Now measure off three more quarts of water and add to the one quart.

Bill's match puzzle proved really trying, but John found the solution in the end. He placed the additional three matches upright on the corners of the triangle already made and then sloped the tops inward to meet, forming a three-sided pyramid. John's puzzle was easier. To begin with he must have had eight marbles, and Bill ten.

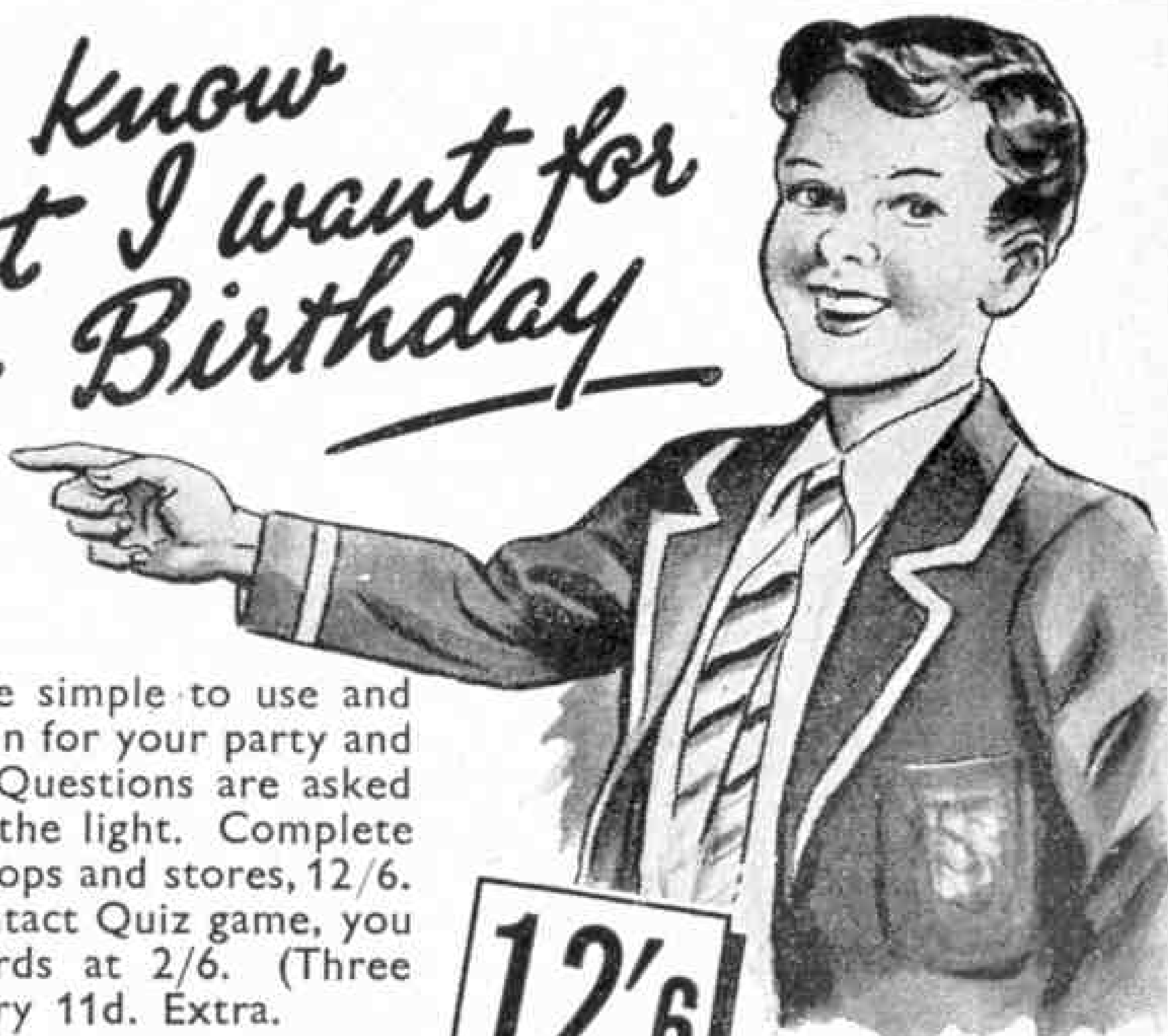


"So you were hurrying to an accident?
Well, you've arrived."

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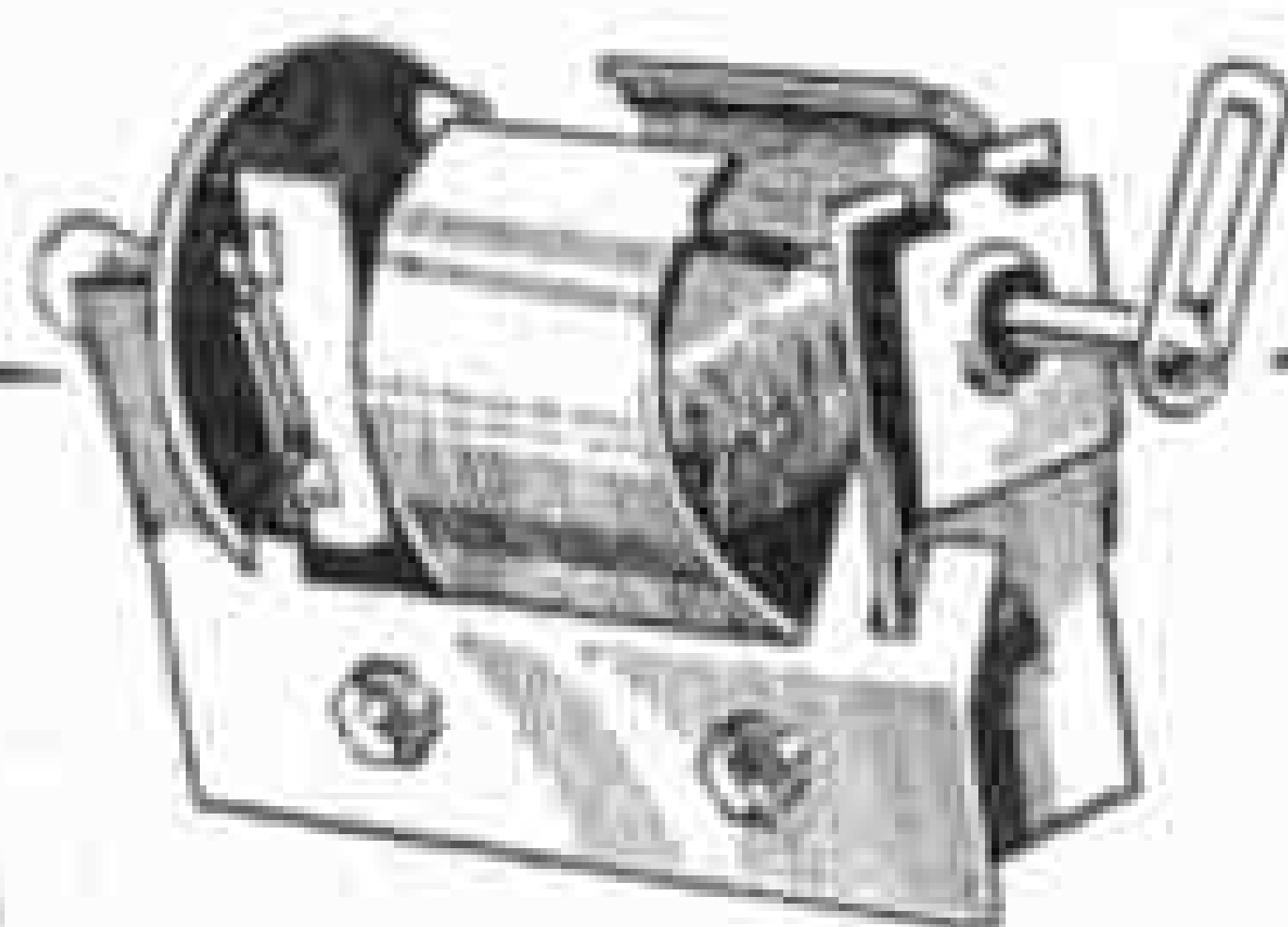
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and
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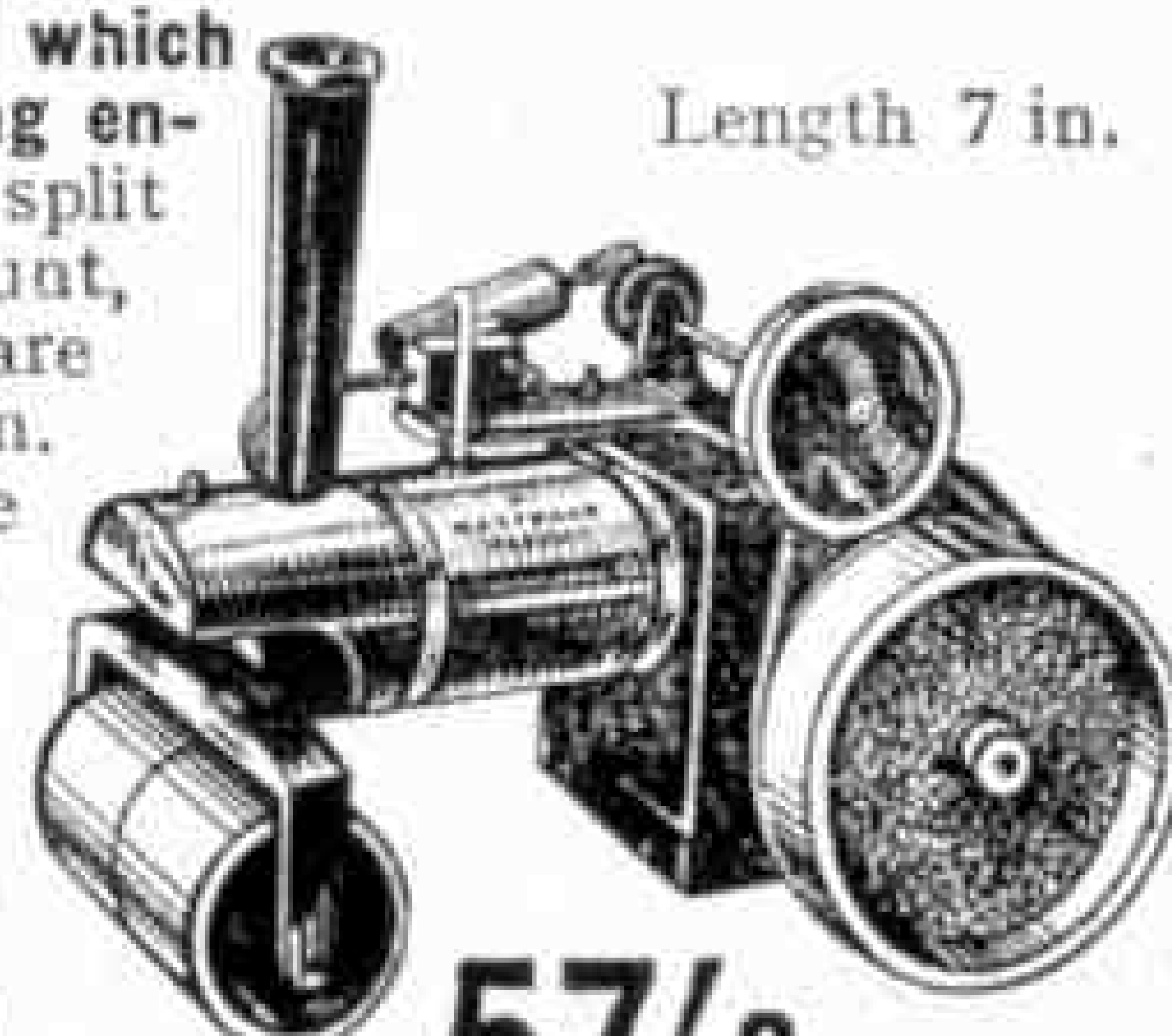
Usually 8/3

6'11

STEAM ROLLER

A 'live steam' model which will delight the young engineer. The wheels, split rollers, engine mount, and boiler casing are die cast aluminium. Engine and boiler are of brass. Finish is polished aluminium with red and green enamel. Complete with safety valve, spirit burner, funnel and filler cup. Post & Pkg. 1/6

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57'6

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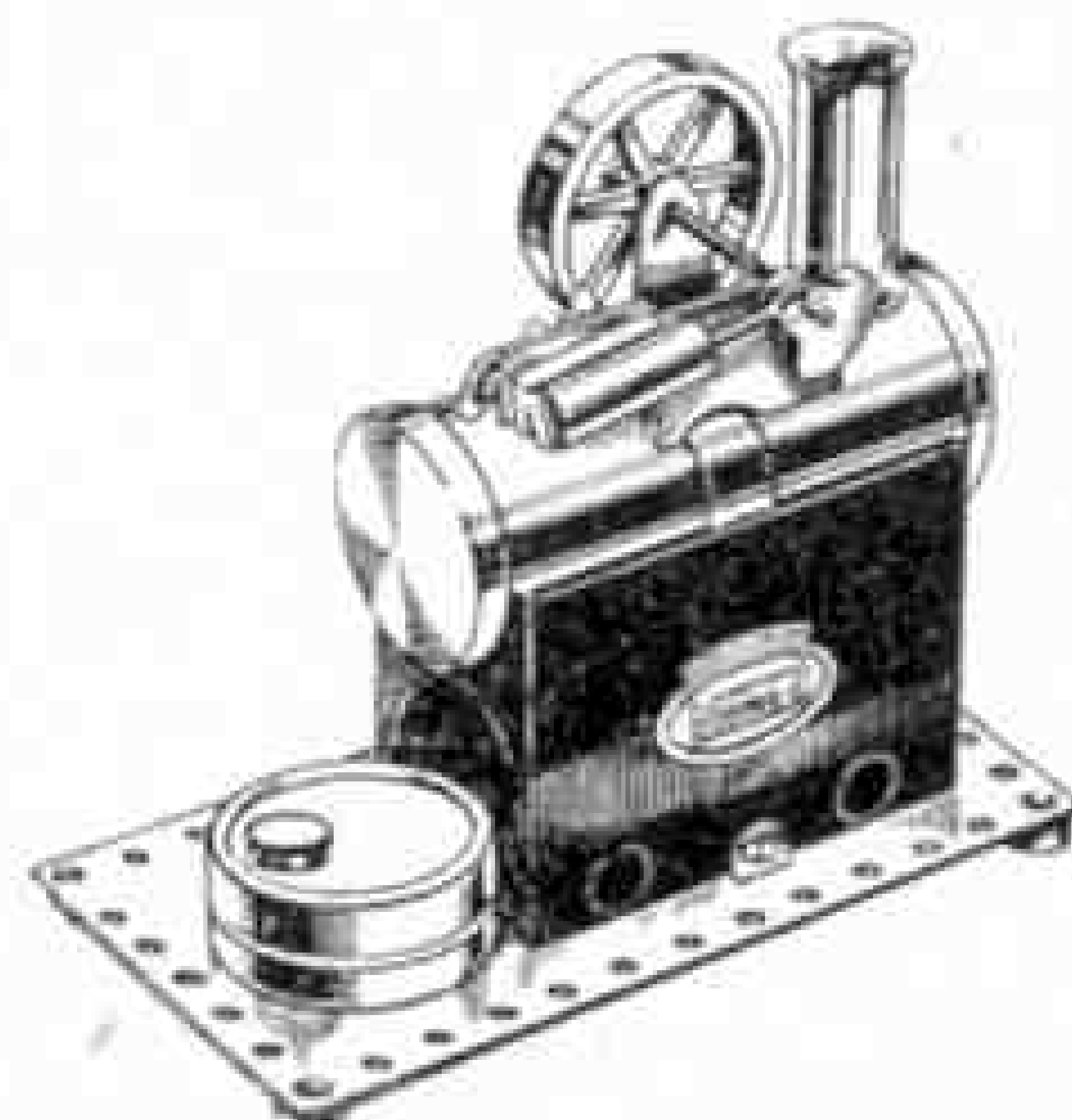
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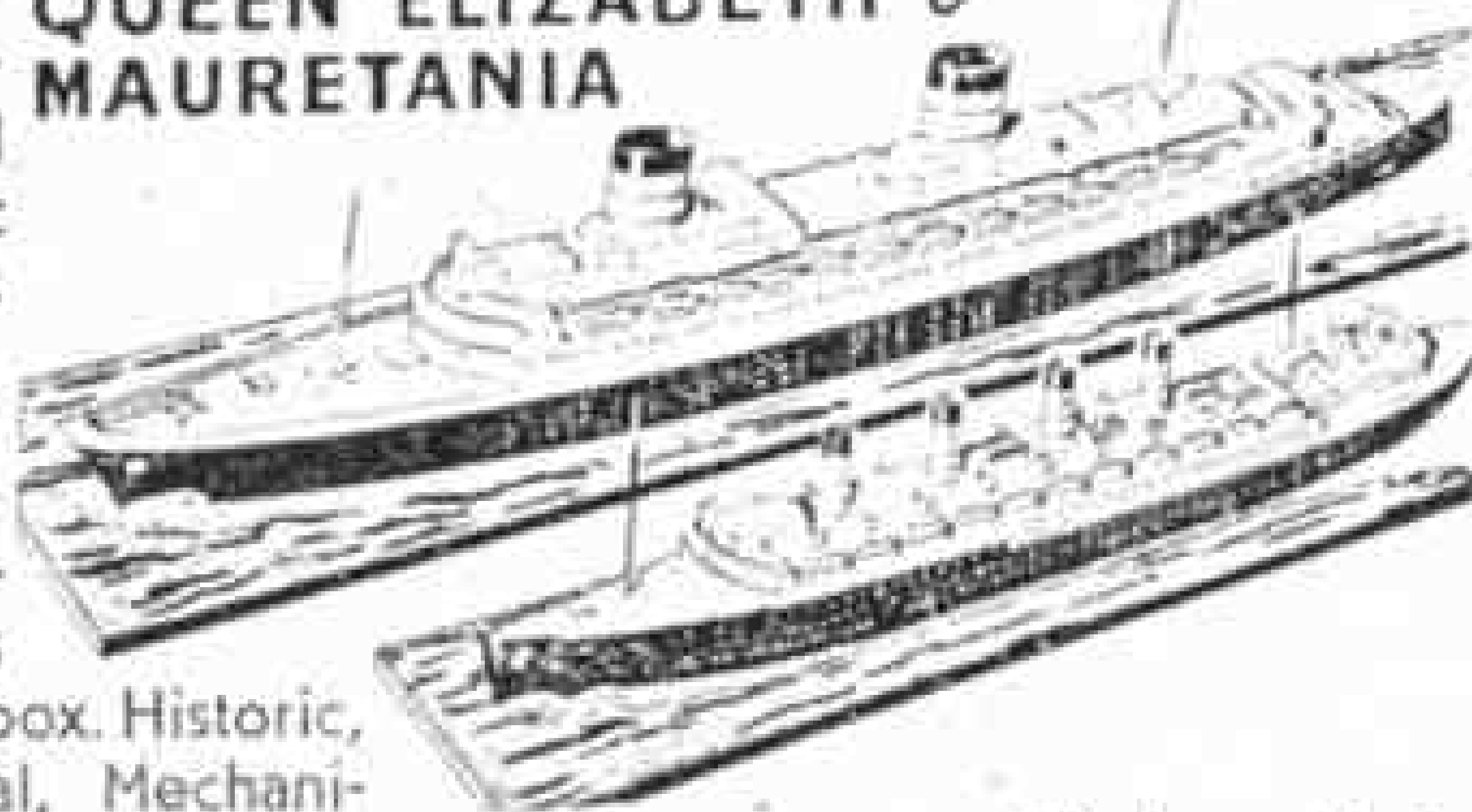
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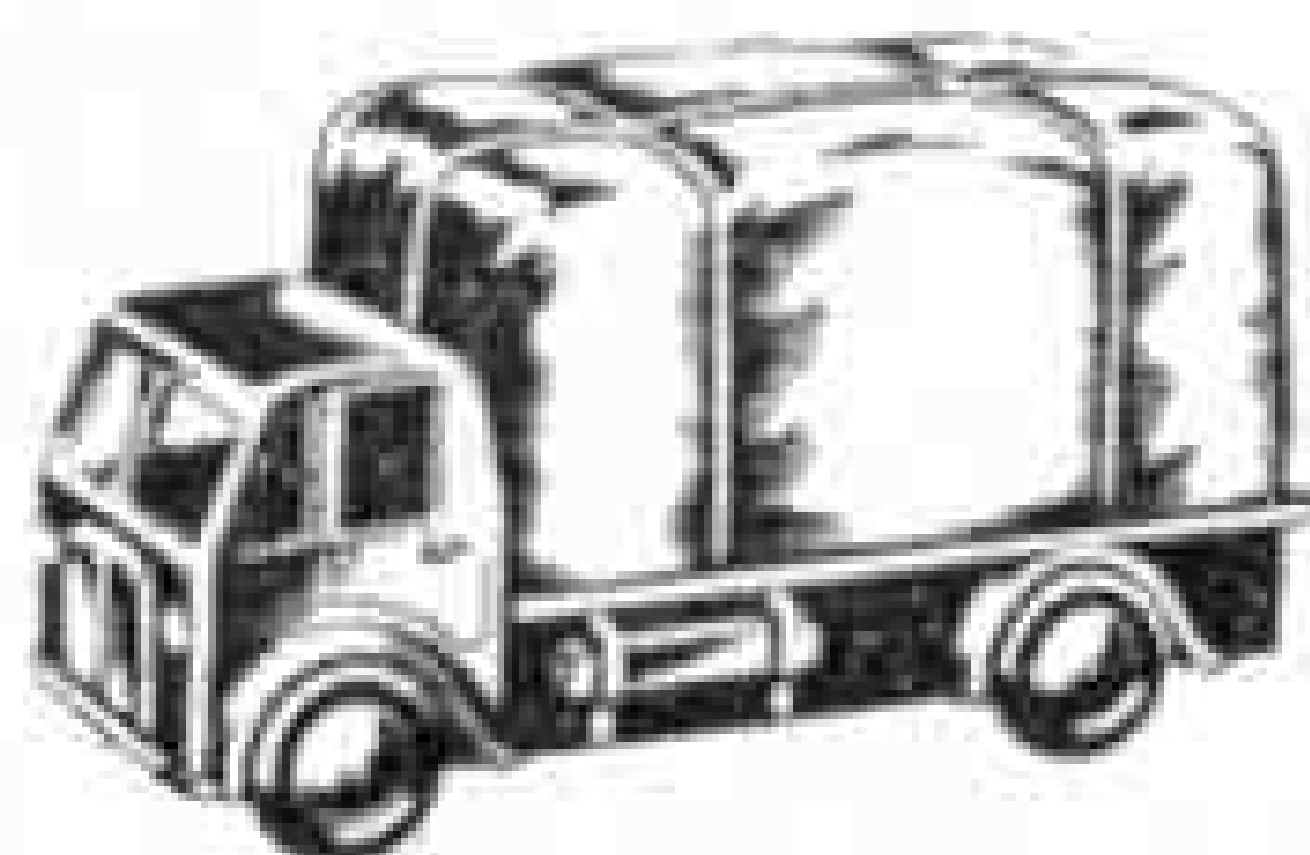
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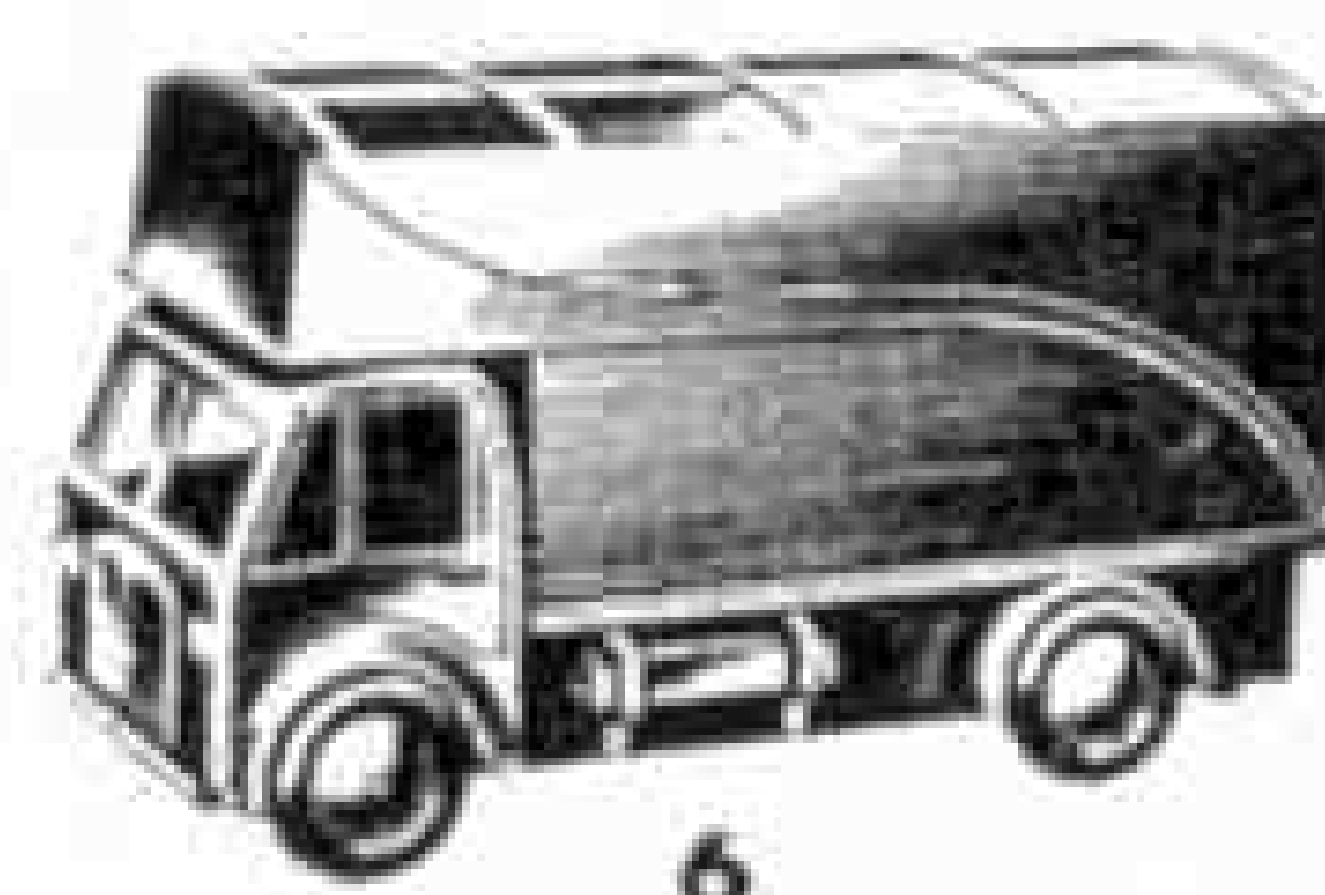
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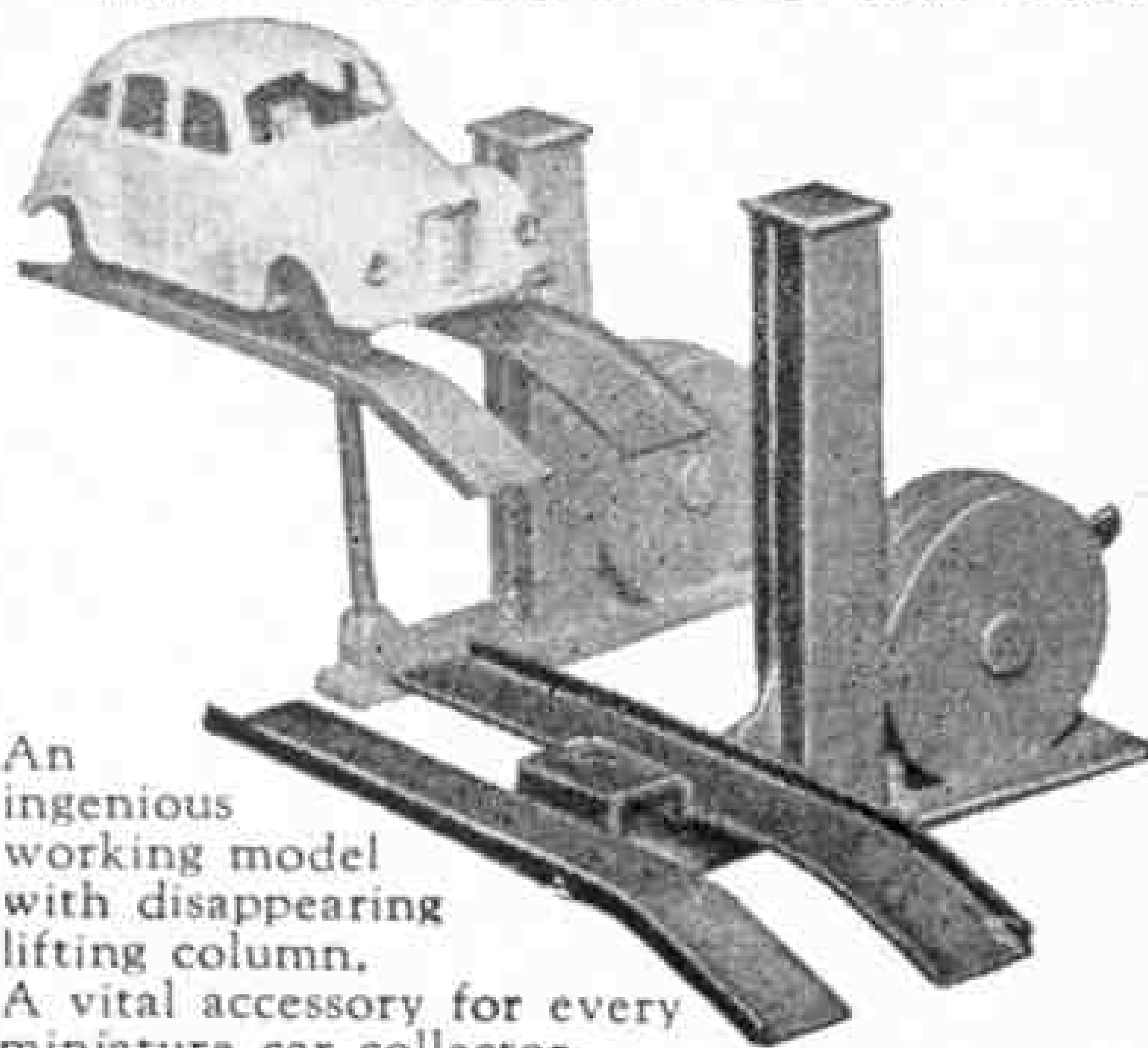
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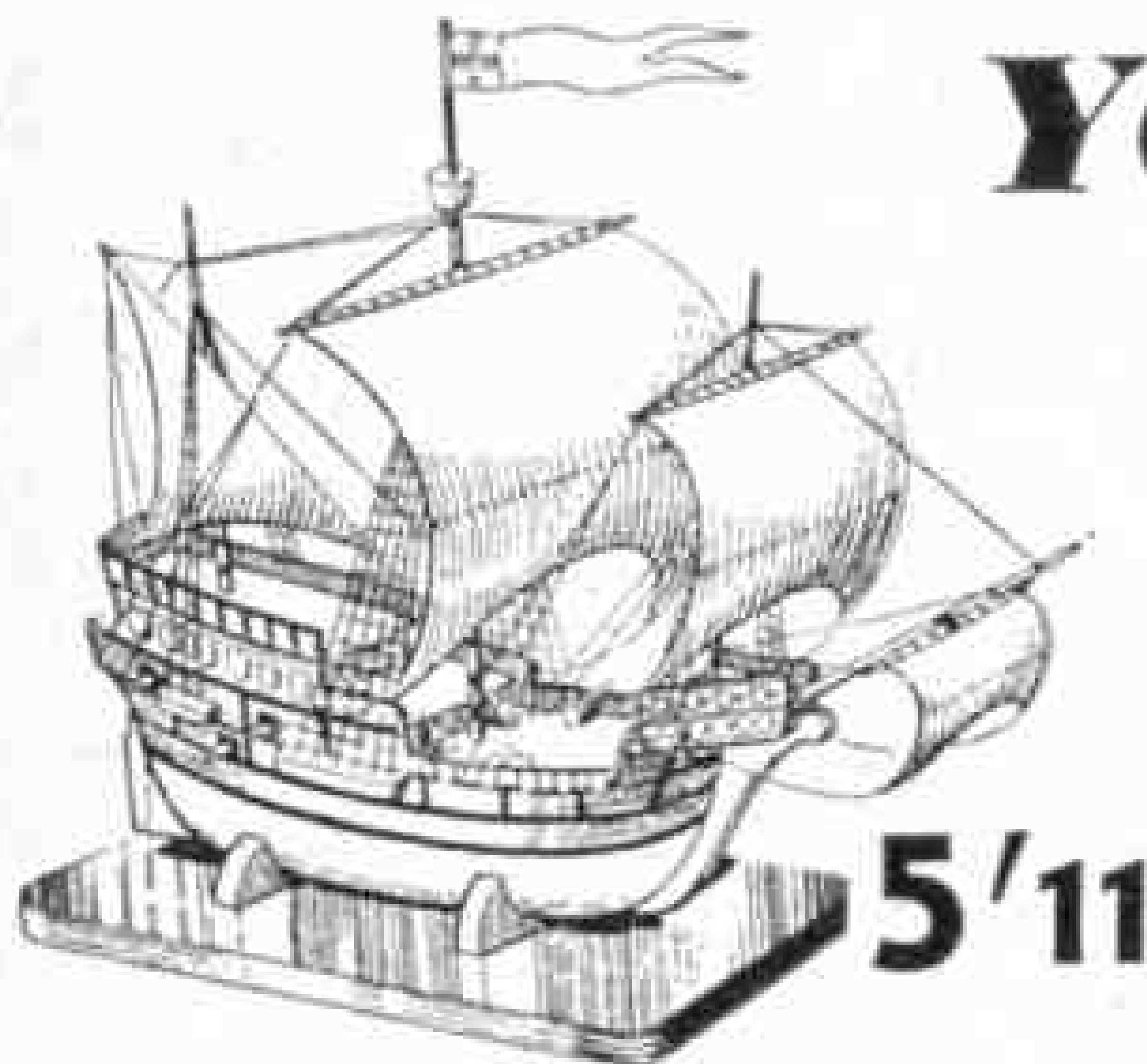
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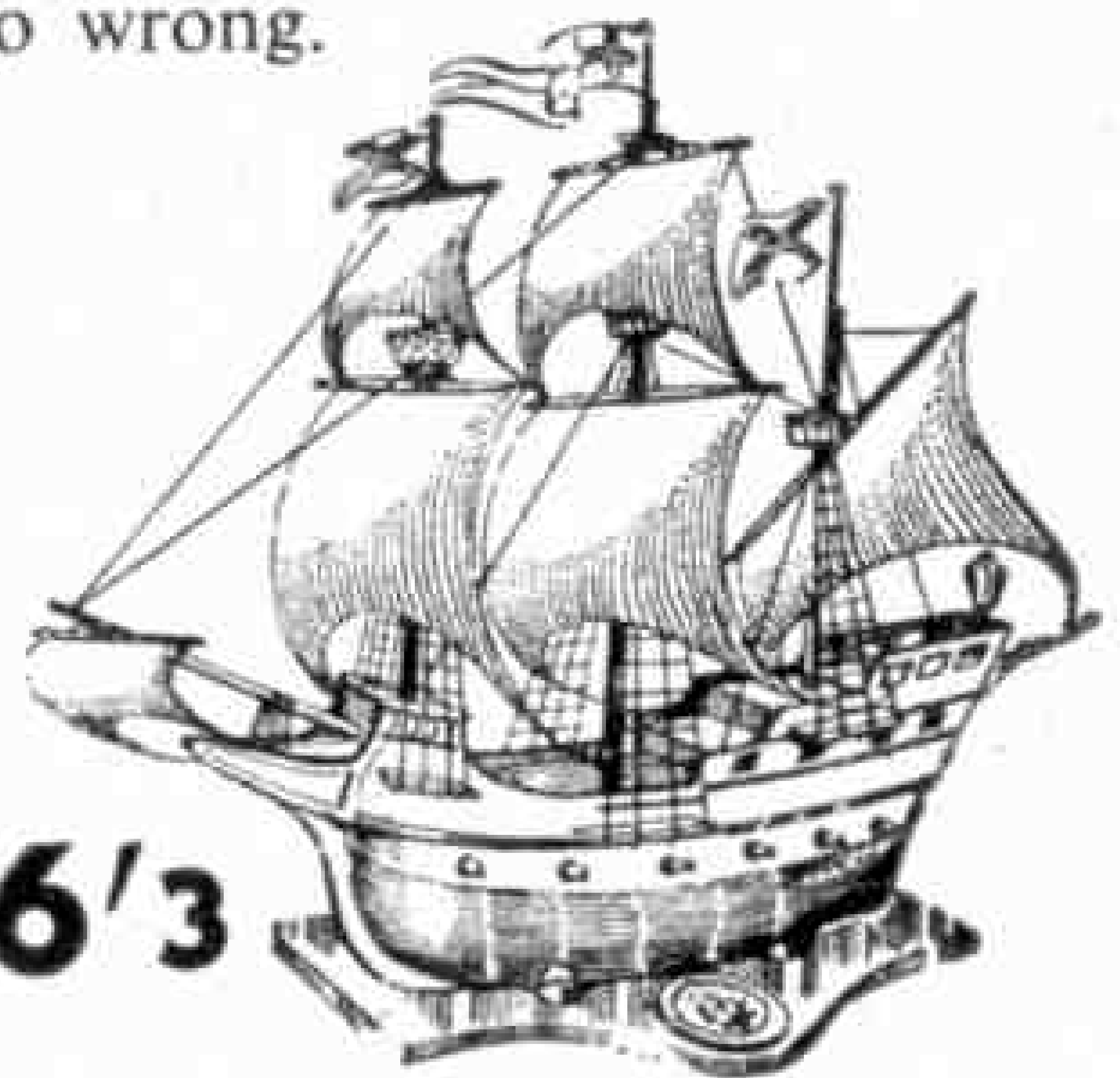
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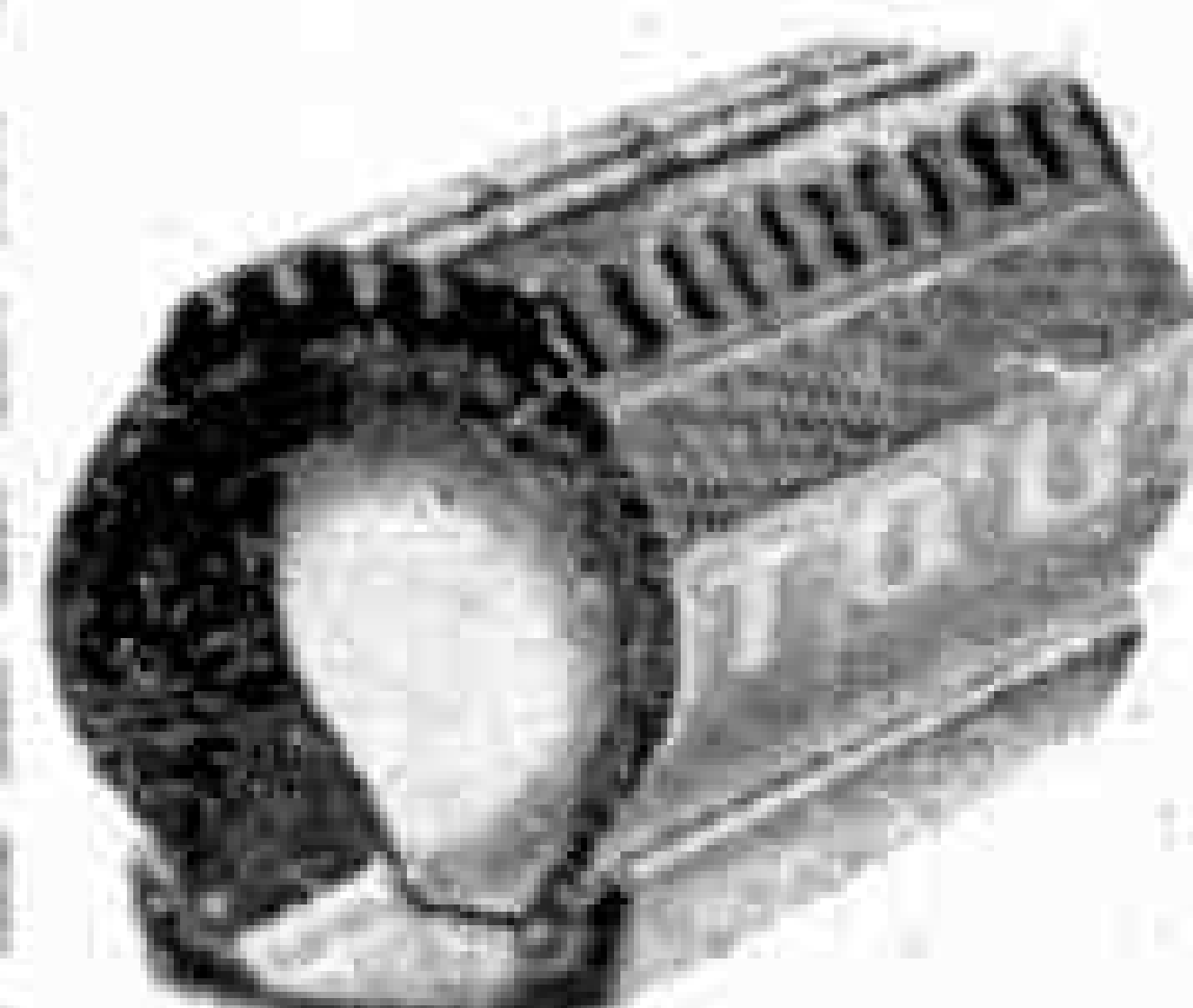
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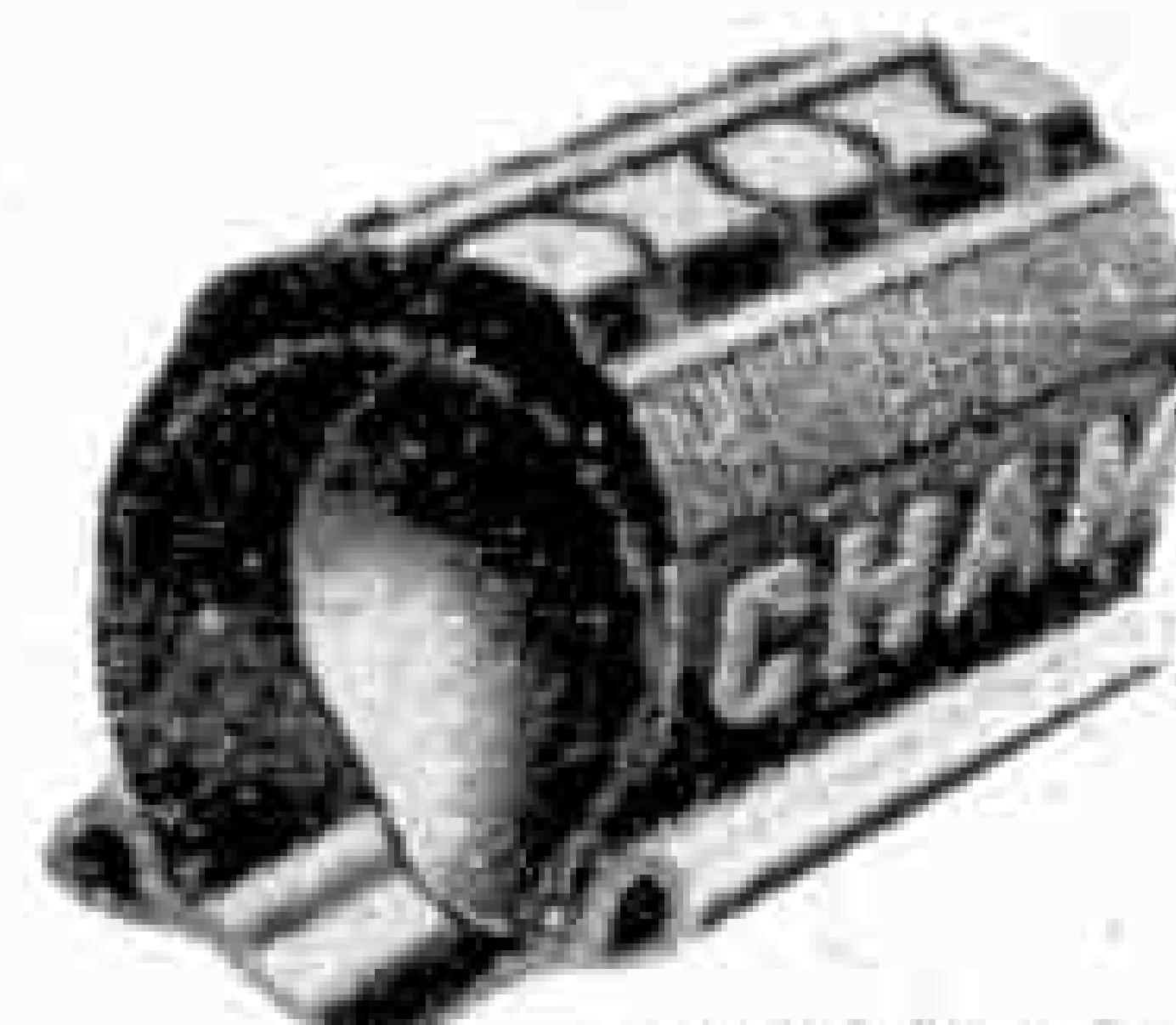
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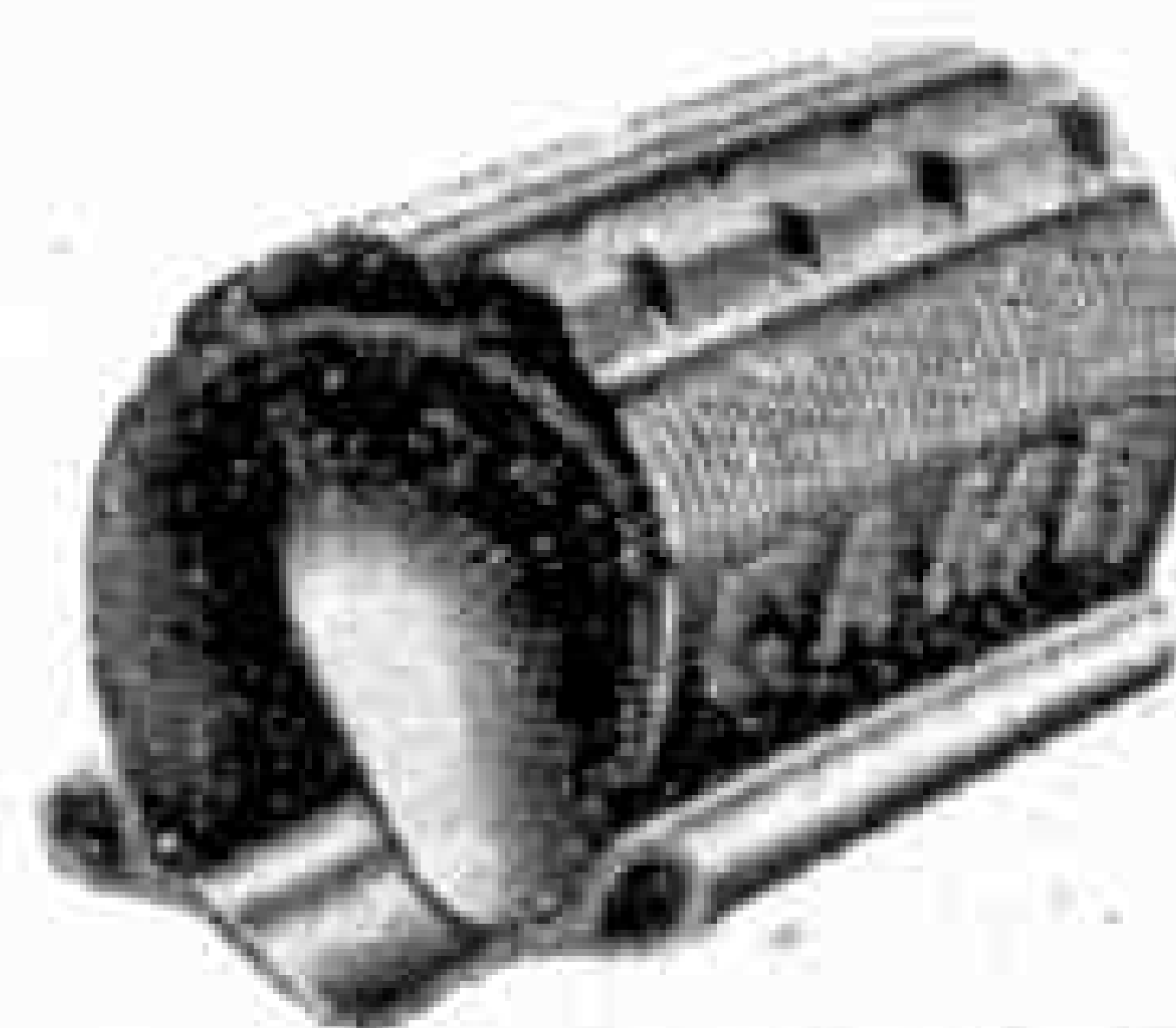
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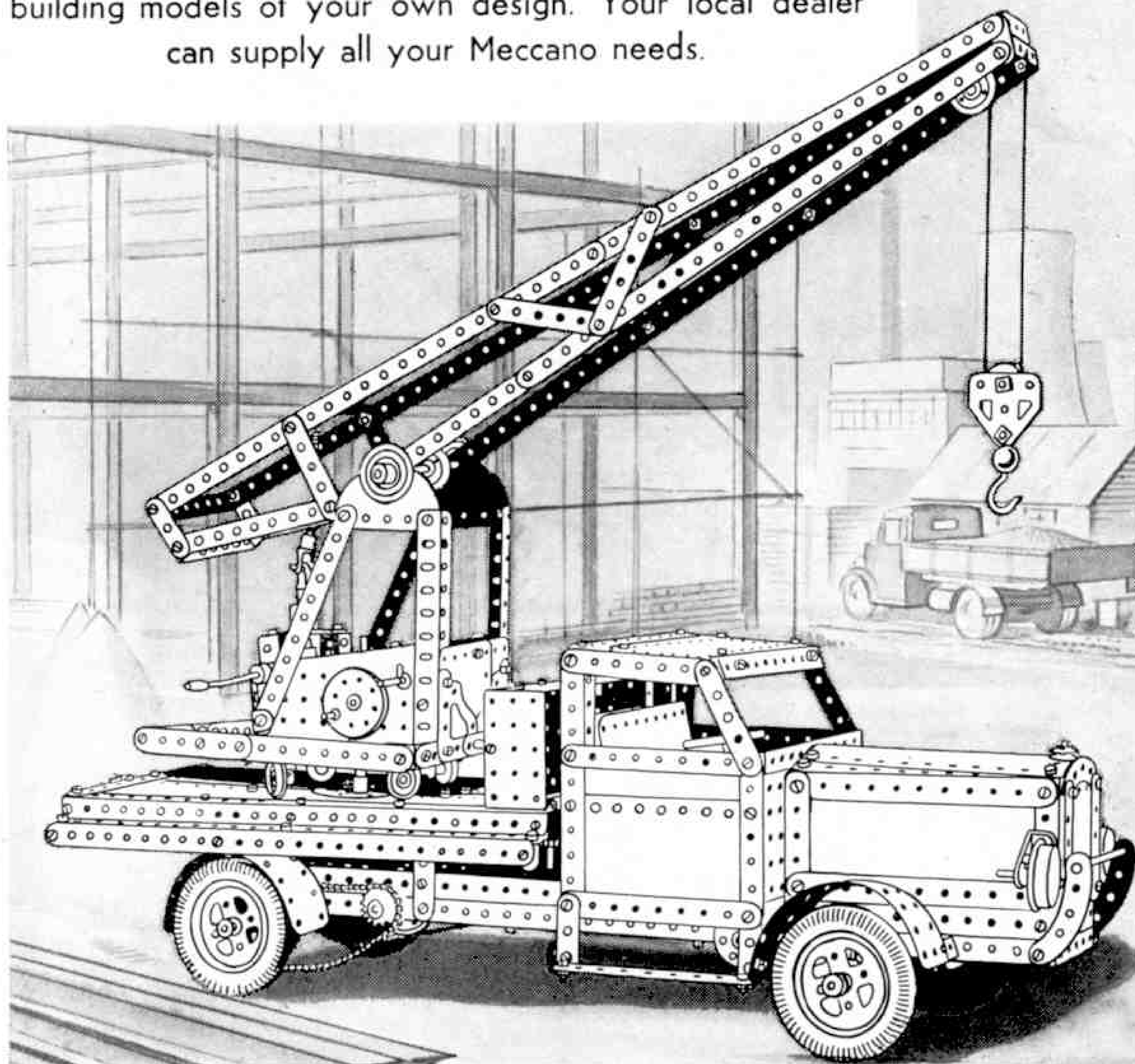
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